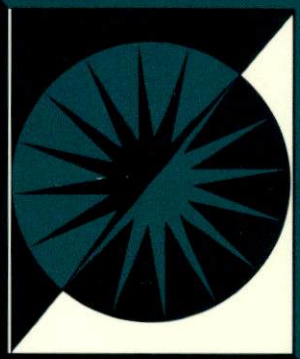

FOR DOS

MS 92

MINISOFT 92

MINISOFT 92

Reference Manual

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MiniSoft 92 Features List

- A screen display capacity of up to 43 lines and 132 characters per line.
- Configuration menus for terminal and data communication operations. These menus can be saved and reused.
- Support of display enhancements, including inverse video, underlining, blinking, and security. These enhancements can be configured for both monochrome and color screens.
- Eight user-definable function keys are displayed on screen, including support of the System function key hierarchy.
- Support for COM1, COM2, COM3, and COM4.
- Comprehensive Command Language, including auto login, auto logoff, modem dialing and disk backup.
- Multi-page scrolling memory up to 60 pages.
- ASCII and BINARY file transfer between the HP minicomputer and PC through a modem or direct connection.
- Proprietary, Xmodem, and Xmodem CRC 1K file transfer protocols.
- PC to host printing. Direct the output of most PC based word processing, graphics, and spreadsheet packages to printers connected to the host.
- Local printer support including: Log Bottom, Record Mode, and Print Screen Memory.
- "Pop down" function keys to accomodate full screen display.
- Option for non-English function keys, menus, error message.
- Support for Novell, LAN Manager, Banyan, Lantastic, NS/VT, TCP/IP, and Telnet. Also support for ODI, NDIS, and Packet Driver specifications.
- Powerful trace facility for debugging and error detection.
- Baud rate support from 300 through 19,200.
- HP 2392A and 70092 terminal emulation support for both character and block mode operations.
- HP ANSI and VT100 terminal emulation included for use with non-HP computer systems.
- Keyboard remapping and programmable function keys.
- Destructive backspace and typeahead.
- Capture screen display to local disk file.

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TABLE of CONTENTS

Chapter 1:
Installing MiniSoft 92 3
Executing MiniSoft 92 5
Installing File Transfer 6

Chapter 2:
Configuring MiniSoft 92 13
Configuration Keys 16
Special Configuration 18
Color Configuration 26
Datacomm Configuration 27
Terminal Configuration 29
Network Configuration 32
Host Configuration 34

Chapter 3:
Running MiniSoft 92 35
Function Keys 35
Transferring Files 48
Exiting MiniSoft 92 53
Help (ALT-H) 54
Modem Dialing 55

Chapter 4:
MiniSoft 92 and LANs 59
General Requirements 61
Host Software 63

Chapter 5:
Installing MS92 on a LAN 65
Installing Device Drivers 66
Clarkson Packet Drivers 76
Chapter 6:
Configuring MS92 on a LAN 83
Configuring for Telnet 84
Configuring for Network Services 87
Configuring for LAN Workplace 90
Other connections 92
Utilities 96
Appendix A:
MS92 Command Language
Appendix B:
MS92LITE Command Language
Appendix C:
Troubleshooting
Glossary of Terms
Index

PART ONE

Installing, Configuring, Running MiniSoft 92

PART ONE

INSTALLING MINISOFT 92

All versions of MiniSoft 92 run on IBM PC or compatibles operating DOS 2.0 or higher. The programs can be run directly from the floppy disk or loaded onto a hard disk system.

MiniSoft 92 is shipped with two executable programs: MS92.EXE and MS92LITE.EXE. In most cases users will want to use MS92 since it provides both serial and LAN connectivity. It also features support for the same powerful command language included with MiniSoft 92 for Windows. Users will want to consider using MS92LITE if the PC they are operating has limited memory and disk space. Users of older model PCs and XTs will also find MS92LITE the optimum choice. Existing customers who have developed scripts with the "original" MS92 command language may find MS92LITE attractive because it can run their scripts without any modifications. Refer to *Appendix B: MS92LITE Command Language* for information on the MS92LITE command language.

MiniSoft 92 is provided on one to two diskettes depending on the environment and the type of media used. To install the software:

1. Create a new subdirectory from your root directory:
   `c:\> mkdir ms92`

2. Get into the new subdirectory:
   `c:\> cd\ms92`

3. Insert MiniSoft 92 diskette number 1 (if there is more than one diskette) into your PC's floppy disk drive.

4. Copy the contents of the diskette to the MS92 subdirectory:
   `c:\ms92> copy a:\*.*`
   (if the diskette is in the B drive, type `copy b:\*.*`).

5. Insert the next diskette and repeat step 4.

6. If you want MiniSoft 92 to find its configuration (.CFG), message (.MSG), and script (.S92) files regardless of the directory from which you execute MS92, you should add the following statement to your AUTOEXEC.BAT:

   ```
   set ms92=c:\ms92
   ```

Executing MiniSoft 92

To execute the software, type **MS92** at the DOS prompt (If you are running the lite version type **MS92LITE**.):

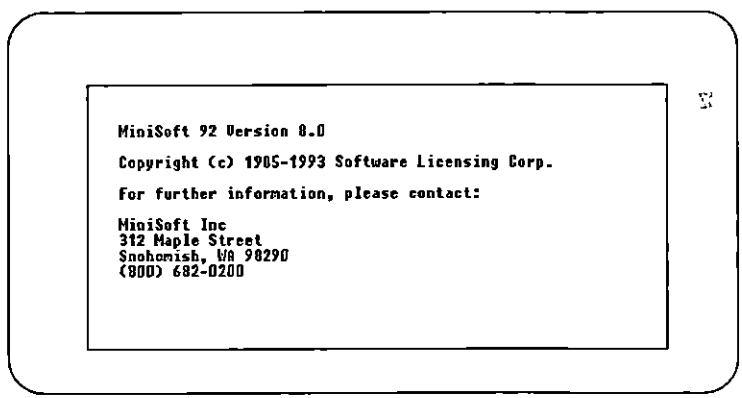
```
c:\ms92> ms92
```

If this is the first time you have run MiniSoft 92, the following message may appear:

```
File MS92.CFG not found: Press any key to
continue
```

This simply means that you have not yet created a default configuration. MiniSoft 92 automatically creates a default configuration file if one does not already exist.

Press a key. A copyright screen appears:



Press RETURN or wait a few seconds for the copyright screen to disappear. If you wish to bypass the copyright screen, add the **h** parameter to the command at the DOS prompt (`c:\ms92\> ms92 h`).

Installing File Transfer

HP3000

MiniSoft 92 uses its own protocol to transfer files between the PC and the host computer system. Part of this protocol resides on the PC and part resides on the host. Before you can transfer any files through serial connections or a network, you must logon and upload one of the following programs to the host: MS92LINK.MPE, MS92LNK2.MPE, MS92LNK3.MPE or MS92LNK4 .MPE (For instructions on configuring MiniSoft 92 so that you can logon to your host, refer to Chapter Two: *Configuring MiniSoft 92*). You should need to upload a link program only once, since it remains on the host after the upload.

Note: If one of these link programs already resides on your host computer there is no need to upload it again.

All of the MiniSoft 92 host programs are designed to work with either MPE/iX or MPE-V operating systems. Use MS92LINK.MPE or MS92LNK3.MPE if you are transferring files through data switches, X.25 networks, or other complex networks. Otherwise, use MS92-LNK2.MPE or MS92LNK4.MPE, which transfer files much faster than MS92LINK or MS92LNK3.

MS92LNK3.MPE transfers files faster than MS92-LINK.MPE, whereas MS92LNK4.MPE transfers files faster than MS92LNK2.MPE. All four programs are provided in order to assure backward compatibility. For example, script files that call for MS92LNK2 can still run with this release of MiniSoft 92.

For the fastest file transfer available with MiniSoft 92, use the MS92LNK4 host program.

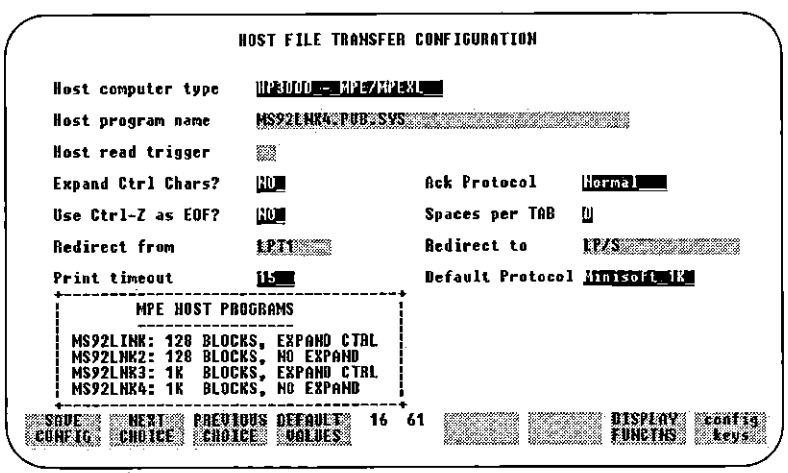
Note: Native Mode link programs are available for users of the XL 900 series HP3000s. The Native Mode option is available for the LNK3 and LNK4 programs, and offers improved performance over the standard LNK3 and LNK4 programs, which run in Compatibility Mode. These programs are included on the installation diskette; the files carry the extension .MPX. They are also available on the MiniSoft BBS (see title page for the number).

To set up the upload procedure, you must access the Host File Transfer Configuration screen, as follows:

1. Press ALT-X to access the menu of Special function keys.

2. Press F4 *config keys* to access the menu of Configuration function keys.

3. Press F8 *host config*. MS92 displays the Host File Transfer Configuration screen:



The upload procedure uses three fields from the Host File Transfer Configuration screen:

1. **Host computer type:** specifies the type of host computer you will communicate with. Use F2 *NEXT CHOICE* or F3 *PREVIOUS CHOICE* to select the appropriate host computer. Press the TAB key to move to the next field in the screen.

2. **Host program name:** specifies which host program (MS92LINK, MS92LNK2, MS92LNK3 or MS92LNK4) is to be uploaded and in what group and account it is to be placed. Type in the name. The example above uploads the program MS92LNK4 into the PUB group and the SYS account on an HP3000. This field does not apply for Xmodem.

   Note: You must have write and save access on the host computer to upload the host program.

3. **Expand Ctrl Chars?** set to **YES** if you are using the MS92LINK or MS92LNK3 host program. Set this field to **NO** if you are using the MS92LNK2 or MS92LNK4 host program. This field does not apply for Xmodem.

4. **Default Protocol:** set to **MiniSoft_128** if you are using the MS92LINK or MS92LNK2 host program. Set this field to **MiniSoft_1K**_if you are using the MS92LNK3 or MS92LNK4 host program. You may also select **Xmodem_1K**___ or **Xmodem _128K**_ if you want to use the Xmodem protocol.

5. When you have established these three settings, press F1 *SAVE CONFIG* to save the configuration.

6. Press F5 *File Transfer* and then F7 *UPLOAD HOST PGM* to upload the link program.

Note: It is very important to set your parity to "NONE/8" when uploading any of the host programs. Any other parity settings will upload the host programs incorrectly. Configure for parity in the Datacomm Configuration screen, discussed on page 27.

Other File Transfer Configuration Options:

Host read trigger: used with X.25 networks. Type a colon (:) in this field when communicating over X.25 networks. In the Host program name field, remember to enter `ms92link.pub.sys;PARM=58`.

Note: For connections other than X.25 leave the Host read trigger field blank.

Expand Ctrl Chars: allows the software to encode the data being sent or received. Encoding the data makes it possible for non-displayable characters (control characters) that would otherwise not be displayed to be sent through data communication links. When this field is set to **YES**, you must use MS92LINK or MS92LNK3 as the host program name. When this field is set to **NO**, you must use MS92LNK2 or MS92LNK4 as the host program name.

Ack Protocol: specifies either the normal acknowledgment protocol between the PC and the host, or an alternate acknowledgment protocol. Use **Alternate** only when the data communication link you are using will not allow the transmission of ACK CTRL-F or NAK

CTRL-U characters. When this field is set to **Alternate**, you must append the string `;PARM=256` for an HP3000 host. Append the string `256` to the host program name for an HP9000 host. Only HP3000 and HP9000 hosts support the alternate acknowledgment protocol.

Ctrl-Z as EOF: strips a CTRL-Z character from the end of a DOS file when transferring an ASCII file to the host. Some DOS applications create ASCII files with a CTRL-Z as the last character to denote the EOF. Setting this field to **YES** prevents the CTRL-Z from being transmitted to the host.

Spaces per Tab: converts tabs in an ASCII DOS file to spaces when transferring the file to the host. A value of **0** will pass the tabs through, while any other value (1-8) replaces the tabs with the specified number of spaces.

Redirect: specifies the PC printer port(s) you want redirected to the host computer. Enter the device (LPT1 or LPT2) to be redirected to the host in the "from" field. Enter the host printer's logical device number or device class in the "to" field. If the host printer is connected serially, remember to add `/S` to the device name or number as shown in the sample Host File Configuration screen. If the host printer is a parallel device (i.e., line printer) leave the `/S` off. Refer to page 42 and Appendix B for more information on printing files to the host and redirected printing.

Print timeout: specifies the amount of time in seconds that MiniSoft 92 will wait before sending an EOF, releasing the file to be printed.

HP9000

The facility for uploading the HP9000 host program is not currently available. Instead the MS92LINK host program is provided to the user on diskette under the name **ms92link.800** (for 9000 700/800 series) or **ms92link.300** (for 9000 300/400 series). Users who have Kermit or Xmodem can transfer this file to the HP9000. By request, MiniSoft, Inc. will provide the host programs on magnetic, cartridge (CS-80), or DAT tape. Install the MS92LINK host program as follows:

1. Logon as "root" and get into the "/usr/bin" directory:

   ```
   login: root
   $ cd /usr/bin
   ```

   (Placing ms92link in /usr/bin insures that this program is in every user's PATH.)

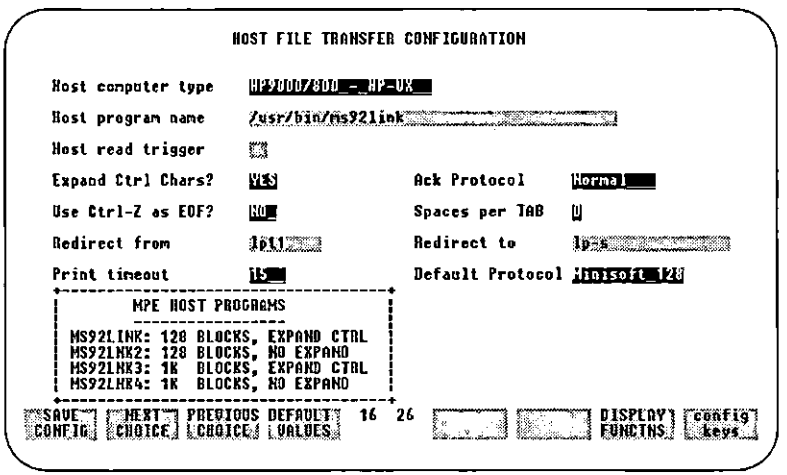
2. Extract the file ms92link from the distribution media:

   ```
   $ tar xvof <tape dev>
   ```

3. Follow the steps for accessing the Host File Transfer Configuration screen for the HP3000 and the steps for configuring file transfer. Remember on the HP9000 that the host program name must be in lower case.

   Note: If you set the Ack Protocol field to **Alternate**, you must append the string `256` to the host program name for an HP9000 host.

4. The following screen is an example file transfer configuration for an HP9000. Note that the host read trigger field should be blank.



CONFIGURING MINISOFT 92

In order to run a host session from your PC with MiniSoft 92, you must configure MiniSoft 92 to communicate with the host computer.

Configuration File

Your configuration settings are stored in a configuration file, which has the extension CFG. The first time you run MiniSoft 92, the software runs a default configuration file, MS92.CFG. You should adjust the default configuration so that the settings are right for your system. You may also create alternative configurations for various connections. For example, you might have separate configuration files to run MiniSoft 92 serially or on a network, or to connect to an HP3000 or HP9000 host.

This chapter explains how to choose your configuration settings using the menu of configuration function keys. The changes you make to your configuration are active

until you exit MiniSoft 92. At this point, if you made any changes to the configuration, MiniSoft 92 prompts:

```
Save configuration changes? Y to confirm
```

If you respond `Y` the following prompt appears:

```
Enter File Name to save as. Press ESC to exit
```

If you press RETURN the configuration will be saved under the default filename, MS92.CFG, overwriting the previous MS92.CFG.

To save the current settings under a different name, type a new file name and press RETURN. (If you enter a file name that already exists, MiniSoft 92 writes the new settings over the old ones.

If you press ESC , MiniSoft 92 quits without saving your changes. Your MS92.CFG file is unaltered.

Running a different configuration

You may run MiniSoft 92 under any configuration settings you saved to a file. To do so, include the configuration file as a parameter when you execute MiniSoft 92 from the DOS prompt:

```
c:\ms92>MS92 <config file>
```

For example, typing `ms92 ms92.cfg` runs MiniSoft 92 under the same configuration as typing `ms92`, since MS92.CFG is the default configuration file.

You can use configuration files for particular kinds of connections or sessions. For instance you might have a configuration file called HP3000.CFG for connecting to your HP3000 host, and another called HP9000.CFG for

connecting to your HP9000 host. Configuration files must have the extension CFG.

Create a new configuration file by executing MiniSoft 92 normally, changing the configuration, and then saving those changes to a file name other than MS92.CFG.

Configuring messages and screen labels

The messages and labels that MiniSoft 92 writes to your screen are stored in the file MS92.MSG. This file is included on the MiniSoft 92 installation diskette, and resides in the directory where you installed MiniSoft 92 (usually C:\MS92).

The catalog of messages and labels in MS92.MSG includes:

- error and information messages
- prompts
- function key labels
- field labels in configuration screens

If you wish, you may edit MS92.MSG in a text editor to customize these messages and labels. This is especially useful for translating the messages and labels into languages other than English.

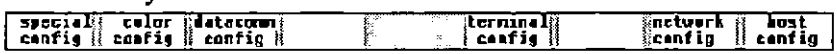
If you edit this file, edit the text only. Do not edit catalog numbers (far left column) or remove quotation marks.

Since MiniSoft 92 accesses this file while it is running, you must exit from MiniSoft 92 before editing the file. You must also save your changes and close the file before running MiniSoft 92 to implement the changes.

Configuration Keys

When you execute MiniSoft 92, the screen displays the eight HP function keys across the bottom. These are the Modes function keys (You may configure MiniSoft 92 to display a menu of user-defined function keys instead. See pages 36 and 45.).

Press ALT-X to display the Special function keys, and then press F4 *config keys* for a menu of configuration keys:



Note: You may also access the menu of configuration keys from the System function keys, by pressing ALT-S and then F8.

In order to run host sessions, you must configure Mini-Soft 92 using this menu of function keys. The keys control configurations as follows:

F1 - Special Config: Press this key to display the Special Configuration screen and configure typeahead, local printing, screen memory, 132 column display, video card adapter, and keyboard remapping.

F2 - Color Config: Press this key to display the Color Configuration screen and configure the colors of your screen display. Most screen enhancements can be modified through this screen.

F3 - Datacomm Config: Press this key to display the Datacomm Configuration screen and configure baud rate and communications handshaking.

F5 - Terminal Config: Press this key to display the Terminal Configuration screen and configure terminal ID, foreign language support, and terminal emulation mode (VT or HP).

F7 - Network Config: Press this key to display the Network Configuration screen and configure LAN connections, including Telnet, Network Services, Interrupt 14, BAPI, LAN Workplace, and NACS.

F8 - Host Config: Press this key to display the Host File Transfer Configuration screen and configure for file transfer, printing to host, and installation of the file transfer host programs (see Chapter One: *Installing MiniSoft 92*).

The fields in each configuration screen allow you either to select pre-defined settings or to enter information (Fields for entering information are displayed in inverse video.). To select the pre-defined settings, use the F2 *NEXT CHOICE* and F3 *PREVIOUS CHOICE* keys. The configuration screen function keys are as follows:

F1 - Save Config: Press this key to activate your settings for the current session only. You will be prompted to save the changes permanently upon exiting MiniSoft 92.

F2 - Next Choice: With the cursor in a configuration field, press this key to move forward through the list of available selections.

F3 - Previous Choice: With the cursor in a configuration field, press this key to move backward through the list of available selections.

F4 - Default Values: Press this key to set all values in the current configuration screen to their defaults.

F7 - Display Functions: Press this key to cause functions to be displayed rather than executed (Pressing the RETURN key, for instance, would not issue a carriage return, but would print a symbol to the screen.). An asterisk displayed on this key indicates that the option is active.

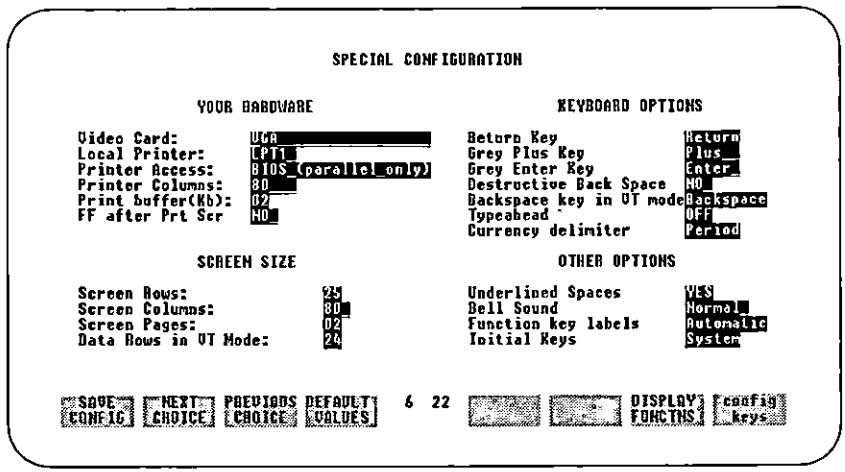
F8 - Config Keys: Press this key to access the menu of configuration keys.

The following sections of this chapter address each configuration menu.

Special Configuration

The Special Configuration screen allows you to configure the MiniSoft 92 screen display and function key label settings. You may enable typeahead, configure up to 60 pages of screen memory, and remap certain function keys.

To view this screen, from the Config Keys menu, press F1 *special config*:



Your Hardware

Video Card: specifies which video card you have installed in your PC. Use the F2 *NEXT CHOICE* or F3 *PREVIOUS CHOICE* key to select a setting for the following video cards, in the order shown:

- Standard (for mono, CGA, Hercules or compatible cards)
- EGA
- VGA (for VGA cards without an enhanced graphics feature; allows you to have a 27 line screen display including 2 line function keys)
- Paradise SVGA 30 (for Paradise VGA Plus, Plus 16 or compatible cards. Use VGAPLUS.EXE supplied by Paradise to improve the clarity of the 132 column display.)
- Special (for video cards that come with special programs that can be used to expand their screen displays to 132 columns or 27 rows)

- Speedstar Super VGA
- Video 7
- HP SVGA
- ATI
- ET VGA-4000 (for Tseng ET VGA-4000 cards)
- Orchid (for Orchid cards, which operate very similar to the Speedstar Super VGA card)
- IBM XGA-2
- HP VGA Monochrome
- HP VGA Color
- MXIC
- Stealth 24 (for Speedstar Stealth 24 cards)
- Stealth Pro (for Speedstar Stealth Pro cards)
- Speedstar Pro
- Viper VLB (for Speedstar Viper VLB cards)
- TVGA 9000
- Paradise Accelerator
- Paradise Accelerator VL Plus
- Paradise Accelerator 24
- Paradise Accelerator SVGA
- Paradise Accelerator Value
- Oak VGA Master

Local Printer: allows you to define a local printer to MiniSoft 92. If you do not have a printer, select **None**. Otherwise, select the name of your printer port.

Printer Access: allows you to specify an output device. If you have no printer, select **No Printer**. If your printer is connected directly to a parallel port, select **BIOS**

(parallel only). If your printer is connected directly to a serial port or if you are printing to a network printer and the PRN device has been redirected to the network device, select **DOS Default Printer.** If you are printing to a network printer and your parallel port has been redirected, select **DOS Named Printer.**

Printer Columns: specifies 80 or 132 column printing. Select **80** or **132** to match your current printer setting.

Print Buffer (Kb): allows you to configure temporary memory for direct (non-network) printers. Use the F2 *NEXT CHOICE* or F3 *PREVIOUS CHOICE* key to configure from 1 to 10 kilobytes of buffer space.

FF after Prt Scr: set to **Yes** to send a form feed automatically when you print from the screen. If this setting is **No**, you must perform a form feed manually at the printer.

Screen Size

Screen Rows: specifies the number of vertical rows to display: 25, 27 or 43. The number of rows or columns you can display depends on your video card. The following table shows which options are available:

	25	27	43
ATI	• †	•	•
EGA	•		•
ET VGA-4000	• †	• †	• †
HP-SVGA	• †	• †	• †
HP VGA Mono and Color	• †	•	• †
IBM XGA-2	• †	• †	•

	25	27	43
MXIC	• †	• †	
Oak VGA Master	• †	• †	• †
Orchid	• †	• †	• †
Paradise Accel 24	• †	• †	• †
Paradise Accel SVGA	• †	•	• †
Paradise Accel Value	• †	•	• †
Paradise Accel VL +	• †	• †	• †
Paradise Accelerator	• †	• †	• †
Paradise SVGA 30	• †	•	• †
Special	•	•	•
Speedstar Pro	• †	• †	• †
Speedstar Super VGA	• †	• †	• †
Standard	•		
Stealth 24	• †	•	• †
Stealth Pro	• †	•	• †
TVGA 9000	• †	• †	• †
VGA	•	•	•
Video 7	• †	• †	• †
Viper VLB	• †	•	• †

• = 80 column mode; † = 132 column mode

Screen Columns: specifies 80 or 132 horizontal column display. See the table for video cards that support 132 column mode. You may scroll right (CTRL-⇨) and left (CTRL-⇦) if your PC lacks 132 column "on-screen" display capability.

Many video cards have an option for 132 column display, which you execute through the card's setup program before running MiniSoft 92. You should also establish a "132 column" configuration in MiniSoft 92, as follows:

1. Using your card's setup program, select 80x25 and then run MiniSoft 92.

2. Select the Special Configuration screen (ALT-X, F4, F1).

3. Choose **Special** in the Video Card field and the rows and columns you wish to use (e.g., 25, 132).

4. Exit from MiniSoft 92 (ALT-X, F2). When the program asks you to save the configuration, type `Y` for yes. Enter the file name of the new configuration (e.g., `132.cfg`).

Each time you want to run MiniSoft 92 in 132 column mode:

1. Use your card's setup program, and select 132x25 or 132x27.

2. Run MiniSoft 92 using the special configuration file you made (e.g., type `MS92 132.cfg`).

Note: Video cards such as Paradise and Speedstar allow you to switch in and out of 132 column mode dynamically, eliminating the need to exit MiniSoft 92 and run the card's setup program.

Note: Host applications that support 132 column display require that the terminal respond with a terminal ID of 700/92. Type "70092" in the "Terminal ID" field located in the Terminal Configuration screen if you want 132 column support with these applications.

Screen Pages: allows you to set the number of screen pages MiniSoft 92 will support in an application. Use F2 *NEXT CHOICE* and F3 *PREVIOUS CHOICE* to

select the number of screen pages up to 60. MiniSoft 92 defaults to 2 pages of screen memory.

Note: MiniSoft 92 uses more memory as you increase the number of screen pages. Running with a large number of screen pages may leave you with insufficient memory for running other applications.

Data Rows in VT mode: determines the number of vertical rows displayed in VT (Digital Equipment Corporation) terminal mode. Select **24** or **25**.

Keyboard Options

Return Key: allows you to configure the key labeled "Enter" on the typewriter portion of the PC keyboard as a block mode enter key or a character mode return key.

Grey Plus Key: allows you to configure this key to function as a tab, return, enter, comma, or plus.

Grey Enter Key: allows you to configure this key to function as a return key in character mode or an enter key in block mode.

Note: The F10 function key always functions as a block mode enter key even on PCs without enhanced keyboards.

Destructive Backspace: allows backspacing to delete characters as the cursor moves to the left. Select **YES** to enable this feature.

Backspace Key in VT mode: allows you to configure the backspace key for **Backspace** or **Delete** in VT mode. To configure for VT mode, go to the Terminal Configuration screen (see page 31).

Typeahead: allows you to type characters before the host is ready to receive them. MiniSoft 92 stores the characters and transmits them when the host is ready. Select **ON** to enable this feature. You may also turn typeahead on and off by pressing ALT-Y.

Note: You must be logged on to the HP host as a terminal type 10 for typeahead to work correctly. If you are not a term type 10, you can force the terminal type by logging on:
`HELLO <GROUP>.<ACCOUNT>;TERM=10.`

Currency Delimiter: allows you to specify **Period** or **Comma** as the delimiting mark for currency-oriented decimal numerals.

Other Options

Underlined Spaces: causes spaces to be replaced by underline characters. Select **YES** to enable this option. In most cases, use this option if you have a color monitor; monochrome monitors display genuine underlining.

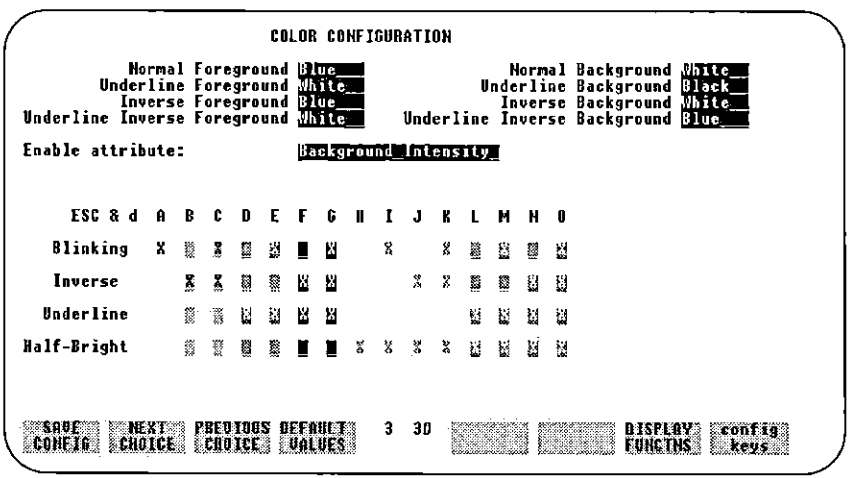
Bell Sound: configures the PC's warning sound. Choices in this field are **Normal**, **Special** (not as loud), **Delayed** (pause before bell sounds), and **None**.

Function key labels: allows you to set the function key labels to automatically pop down and display 24 lines of data. Select **Automatic** to enable this feature. Select **Locked** to have the function key labels fixed at 2 lines. If you have a PC with a VGA or Super VGA video card you can select 27 lines of display in the screen rows field which will provide 2 line function keys. You must select **VGA** or a VGA equivalent graphics card in the Video Card field for 27 line display to work.

Initial Keys: configures which set of function keys displays initially, when MiniSoft 92 is executed. Select **System** (modes keys) or **User** (user defined).

Color Configuration

MiniSoft 92 fully supports color monitors. If you have a color monitor, you can set the foreground, background, inverse, and underline. Any combination of the following colors is supported: white, black, blue, green, red, magenta, cyan (turquoise), or yellow. Use F2 *NEXT CHOICE* and F3 *PREVIOUS CHOICE* to select the appropriate colors for function keys, menus, and screen background. To view the Color Configuration screen press ALT-X, then F4 *config keys* and F2 *color config*.

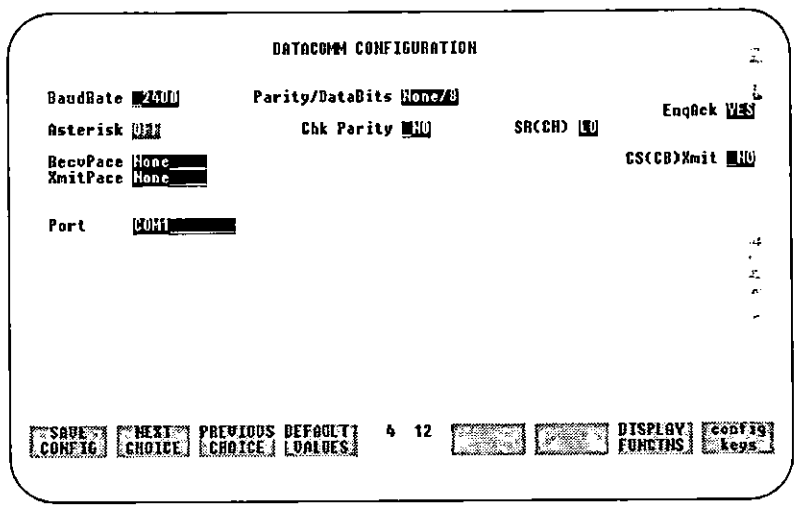


Mapping enhancements on a PC with a monochrome card and monochrome screen is exactly the same as on the 2392A or 700/92, except that underlining and inverse video cannot be shown at the same time. If both enhancements are turned on, only the inverse is shown.

On a PC with a color card and a monochrome screen, the enhancements are mapped the same as the 2392A or 700/92, except that underlining cannot be shown at all.

Datacomm Configuration

The Datacomm Configuration screen allows you to configure your PC for baud rate, communications port, parity, and various handshaking parameters. To access this screen, press F3 *datacomm config* from the menu of configuration keys:



Note: Ignore the baud rate and port fields when making LAN connections.

Baud Rate: This is the speed at which data travels between your PC and the host computer. Choose a setting compatible with your host computer (up to 19,200).

Parity/Data Bits: This identifies a combination of error checking and data units. Choose a setting that

matches your host computer. Select **None/8** when you are uploading a host program (MS92LINK, MS92LNK2, MS92LNK3, or MS92LNK4).

RecvPace/XmitPace (handshaking)**:** These settings identify the signals used by your PC and the host computer to regulate the flow of data. Choose default settings for the terminal ID you specify in the Terminal Configuration screen.

If your host computer's operating system is MPE/iX, choose **Xon/Xoff** for RecvPace and XmitPace settings. If your host's operating system is MPE-V, choose **None** for both of these settings.

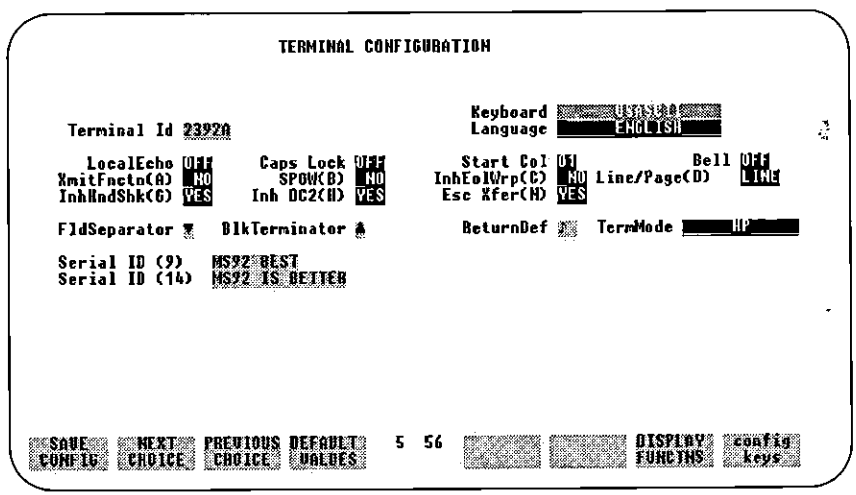
Port: MiniSoft 92 supports serial communications through COM1, COM2, COM3, and COM4. Refer to the table below to determine the best selection for your PC.

Port	Interrupt	Address
com1	4	3F8
com2	3	2F8
com3 - reg	4	3E8
com3 - vectra	10	3E8
com4 - reg	3	2E8
com4 - vectra	11	2E8

Note: MiniSoft 92 also supports the use of alternative interrupts with com3 or com4. Configure com3-reg or com4-reg as the serial port and type **MS92 I=<#>** at the DOS prompt where # represents the interrupt number. For example, **MS92 I=5** would configure MS92 to use interrupt 5 with com3 if com3-reg is the selected communications port.

Terminal Configuration

MiniSoft 92 allows you to configure terminal specifications via the Terminal Configuration screen. You may specify information to help the host computer identify your terminal, as well as handshaking and screen options. From the menu of configuration keys, press F5 *terminal config* to display the Terminal Configuration screen:



Keyboard: This choice defaults to **USASCII**.

Language: This choice determines the language used for the function key labels and screen menus. The choices are **French, German**, and **English**.

Terminal ID: Enter the ID number of the terminal you are emulating (e.g., **2392A** or **70092**).

The 2392A and 700/92 are relatively new terminals, which certain HP software may not recognize. You

may change the terminal ID by typing a different terminal ID (e.g., 2624, 2622). This will not change the emulation features of MiniSoft 92 but will allow the HP host software to recognize the terminal.

Some HP software packages support the 132 column on-screen display features of the 700/92 terminal. You must type `70092` in the Terminal ID box for this feature to work in MiniSoft 92.

Screen Options: Select variables for using your terminal display screen, as follows:

Local Echo: Causes everything you type to appear immediately on your PC screen.

Caps Lock: Capitalizes all typed characters.

Start Col: The horizontal column to begin displaying text (0 = far left).

Bell: Activates your PC's audio alarm.

InhEolWrp (C): inhibits line wrapping.

Line/Page (D): Select **Line** or **Page** to transmit data to the host by the line or by the page; usually you will want to select **Line**.

Handshaking: Make selections to regulate the flow of data between MiniSoft 92 and the host:

XmitFnctn (A): Transmits functions associated with non-ASCII key.

SPOW (B): Causes the spacebar to write spaces over characters.

InhHndshk(G): Inhibits handshaking for block transfers.

Inh DC2 (H): Inhibits handshaking for block transfers.

Terminal Mode: Select either **HP** or **VT** (Digital Equipment VT102) terminal emulation.

Use HP emulation for connections that require HP2392A or 700/92 support. Choose VT terminal when making connections to VAX and Unix computer systems. Many bulletin boards (BBS) also require VT emulation.

MiniSoft 92 displays your current emulation setting (HP or VT) in the lower left corner of the screen. If you change this setting during a session, MiniSoft 92 resets the function keys and runs the new setting.

Serial ID: Some host software packages use two special escape sequences designed by Walker, Richer and Quinn to identify the emulator in use and (in the case of Reflection) the serial number. These escape sequences ask the emulator to respond with a 9-byte or 14-byte string. To help the host software identify MiniSoft 92, we use the default settings of MS92 BEST and MS92 IS BETTER.

The two escape sequences are summarized below.

Sequence	*Terminal*	*Reflection*	*MiniSoft*
[Esc]*s12345^	HP2392A	WRQ-nnnnn	MS92 BEST
[Esc]*s12347^	HP2392A	I01 + 200Innnnnn	MS92 IS BETTER

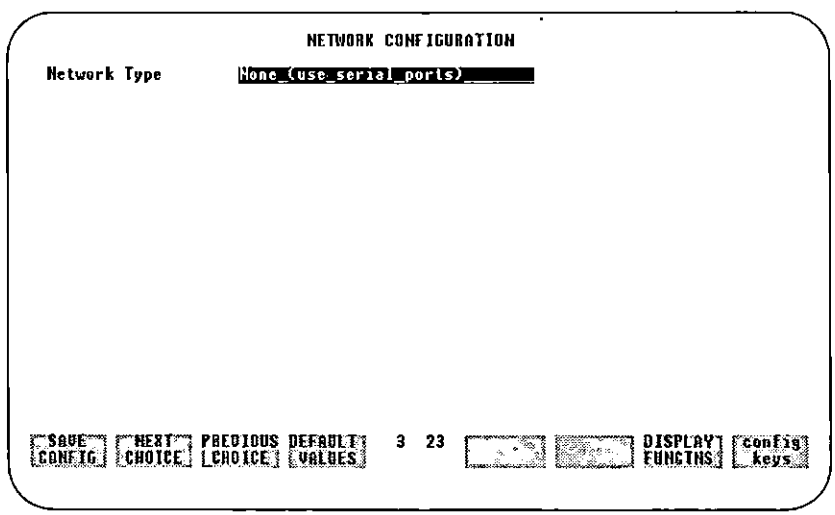
In the examples above, nnnnn stands for a WRQ serial number. MiniSoft 92 does not have an accessible serial number so it will respond with either the words "MS92

BEST" or "MS92 IS BETTER". In both cases, the standard handshaking used for obtaining a terminal ID applies.

Some host software will not work unless it receives a valid WRQ serial number. For this reason, we have provided two fields on the Terminal Configuration screen that enable you to specify the response that MS92 gives to these escape sequences. You can enter character strings equivalent to the responses given by Reflection. Examples might be `WRQ-12345` for the 9-byte sequence and `I01+200I123456` for the 14-byte sequence.

Network Configuration

From the menu of configuration keys, press F7 *network config* to display the Network Configuration screen:

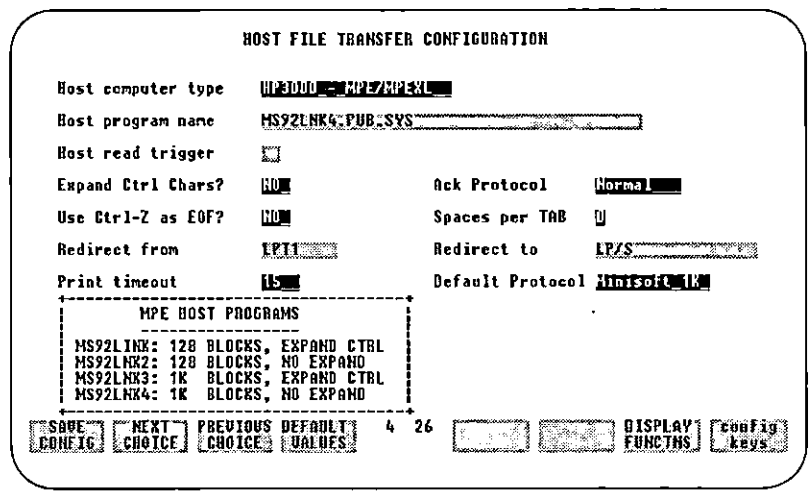


If your connection to the host computer is serial (a direct cable), or you are dialing in to the host via modem, select the choice for serial connection (shown above).

If your connection to the host computer is over a network, turn to Part Two of this manual for instructions on installing and running MiniSoft 92 over a local area network (LAN).

Host Configuration

From the menu of configuration keys, press F8 *host config* to display the Host File Transfer Configuration screen:



This screen allows you to configure which MiniSoft link program the host computer will use to transfer files. When installing MiniSoft 92, use this screen to upload the link program from the PC to the host computer. See the "Installing File Transfer" section of Chapter One: *Installing MiniSoft 92* for a detailed explanation of the choices on this screen.

CHAPTER 3

RUNNING MINISOFT 92

If you have configured MiniSoft 92 properly (see Chapter Two: *Configuring MiniSoft 92*), your screen displays a system prompt, and you may logon to the host. During your host session, you can run host applications, transfer files between your PC and the host, and print text from the host. This chapter explains the MiniSoft 92 features that help you run a host session.

Function Keys

MiniSoft 92 supports all of the function keys found on the HP 2392A and 700/92 block mode terminals. In addition, MiniSoft 92 features a number of function keys that provide access to file transfer, networking, typeahead, and many other special functions.

Function Key Label Settings

You may configure MiniSoft 92 to display function key labels as a single line rather than two lines when the

screen paints data on lines ordinarily occupied by function key labels and the status line. To do so, go to the Special Configuration screen (see page 18), and choose **25** for the Screen Rows setting and **Automatic** for the Function Key Labels setting if you have a CGA or EGA graphics adapter. If your graphics adapter is VGA, you must also select **Standard** for the Video Card setting.

You may toggle the function key display on and off by pressing F9.

You may also lock the function key labels in a two line display, even though the screen will paint data on lines occupied by the function key labels. The screen will actually scroll down and then up to accommodate the extra lines of data. To set up this configuration, choose **25** for the Screen Rows setting and **Locked** for the Function Key Labels setting if your graphics adapter is CGA or EGA. If your graphics adapter is VGA, choose **27** for the Screen Rows setting and **VGA** for the Video Card setting.

In its default configuration, MiniSoft 92 starts up with the Modes menu of function keys. You can configure MiniSoft 92 to start up with a menu of user-defined function keys instead by choosing **User** as the Initial Keys setting in the Special Configuration screen.

Function Key Menus

The function key menus give you access to the various sets of HP function keys, F1 through F8. In addition, you may use F9 to toggle the function key display off

and on, F10 as a block-mode enter key, and F12 to refresh the screen.

There are three main menus of function keys in MiniSoft 92, and hierarchies of menus nested within them. The three main menus are accessible through key combinations, as follows:

System Keys	**ALT-S**
Special Keys	**ALT-X**
User Keys	**ALT-U** or **ALT-M**

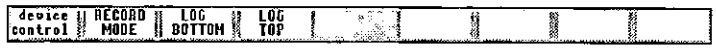
System Keys (ALT-S)

Press ALT-S to display the System menu of function keys. ALT-S corresponds to the User System key on 2392A and 700/92 terminals. Use the System function keys to set margins, tabs, log bottom, and capture to disk. The System function keys also grant you access to other menus of keys, such as Device Control, Margins / Tabs /Col, Modes, and Config Keys. Function key labels in lower case letters bring up a new set of function key labels. An asterisk (*) appears in the label when that key is enabled.

(System) F1 - Device Control:

Pressing this key displays the set of function key labels used to control an external printer:

(Device Control) **F1 - Device Modes:**
Press this key to toggle to Device Mode function keys:



(Device Modes) **F1 - Device Control:**
Press this key to toggle back to the Device Control function keys.

(Device Modes) **F2 - Record Mode:**
Press this key to send incoming data directly to the print destination(s).

(Device Modes) **F3 - Log Bottom:**
Press this key to send data to the printer and/or disk file one line at a time as it is received in display memory.

(Device Modes) **F4 - Log Top:**
Press this key to send data to the printer and/or disk file a line at a time as it is forced off the top of display memory.

(Device Control) **F2 - To Ext Dev:**
Press this key to select the local printer as a destination device.

(Device Control) **F3 - To Display:**
Press this key to select the screen as a destination for copy functions.

(Device Control) **F4 - Advance Page:**
Press this key to send a form feed character to the printer.

(Device Control) **F5 - Advance Line:**
Press this key to send a line feed character to the printer.

(Device Control) **F6 - Copy All:**
Press this key to copy *all* of display memory, starting with the position of the cursor to the last line of the screen, to the device named in "to devices."

(Device Control) **F7 - Copy Page:**
Press this key to copy display memory, from the position of the cursor to the last line of the screen, to the device named in "to devices."

(Device Control) **F8 - Copy Line:**
Press this key to copy the line containing the cursor to the device named in "to devices."

(System) F2 - Margins/tabs/cols:
Press this key to display a set of function key labels used to control margin, tab, and column settings:

(Margins/tabs/cols) **F1 - Start Column:**
Press this key to set the start column for data transfers to the computer using labels LINE MODIFY and MODIFY ALL.

(Margins/tabs/cols) **F2 - Set Tab:**
Press this key to set a tab stop in the column containing the cursor. Any number of tabs can be set per line up to 79. The cursor can be moved to the next tab stop by using the TAB key.

(Margins/tabs/cols) **F3 - Clear Tab:**
Press this key to clear the tab stop from the column containing the cursor.

(Margins/tabs/cols) **F4 - Clr All Tabs:**
Press this key to clear all the tab stops.

(Margins/tabs/cols) **F5 - Left Margin:**
Press this key to set the screen's left margin in the column containing the cursor.

(Margins/tabs/cols) **F6 - Right Margin:**
Press this key to set the screen's right margin in the column containing the cursor.

(Margins/tabs/cols) **F7 - Clr All Margins:**
Press this key to clear *all* the margins set by the user. The left margin is reset to column 1 and the right margin to column 80.

(System) F4 - Modes:
Press this key to display the set of function key labels used to control the operating modes. The Modes function key can also be accessed from the Special function keys (ALT-X):

(Modes) **F1 - Line Modify:**
Press this key to correct a line of text, without having to retype the complete line. You may edit the line of text containing the cursor. This line is transmitted to the host as a block when you press RETURN or ENTER.

(Modes) **F2 - Modify All:**
This mode is similar to Line Modify mode except it is not deactivated by the RETURN or

ENTER key. The block of text you edit is transmitted to the host when you press F2 *MODIFY ALL* again.

(Modes) **F3 - Block Mode:**
Press this key to toggle between Block Mode (an asterisk appears next to the label) and Character Mode (the asterisk disappears).

(Modes) **F4 - Remote Mode:**
Press this key to toggle the terminal between Remote Mode (an asterisk appears next to the label) and Local Mode (the asterisk disappears).

(Modes) **F5 - Smooth Scroll:**
Press this key to turn Smooth Scroll on and off. Smooth Scroll causes the text to scroll smoothly up and down the screen.

(Modes) **F6 - Memory Lock:**
Press this key to turn Memory Lock on and off. Memory Lock can be used in Overflow Protect Mode or Display Lock Mode. *Overflow Protect* is used to prevent data loss due to memory overflow. *Display Lock* is used to lock lines of text on the screen so it does not move using Roll Up or Roll Down.

(Modes) **F7 - Display Functns:**
Press this key to turn Display Functions on and off. In this mode, control characters and control codes are displayed as symbols on the screen.

(Modes) **F8 - Auto LF:**
Press this key to turn automatic line feed on and

off. Auto LF causes a line feed with every carriage return.

(System) F5 - Capture To Disk:

Press this key to direct everything that displays on the screen to a disk file on the PC. When MiniSoft 92 prompts you for a file name, type a fully qualified path designation (e.g., `c:\ms92\hpfile.txt`) and press RETURN.

(System) F7 - Print To Host:

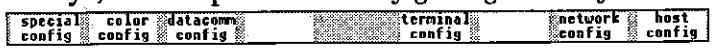
Press this key to direct any PC disk file to a host based printer for printing. When MiniSoft 92 prompts you for a file to print, type a fully qualified path designation (e.g., `c:\ms92\hpfile.txt`) and press RETURN. You may direct spreadsheets, PC graphics, and word processing documents to printers attached to the host computer.

In order to use this feature, be sure that your host printer is defined under the Host File Transfer Configuration screen. Make sure you type in just the logical device number or device name in the Redirect to field. You can also direct PC files to a disk-file on the host by typing `DISC/S` in the Redirect to field. On the host, the file will be called MWLIST.

You must be logged on for "print to host" to work, and one of the link files (e.g., MS92LINK) must be present on your host (see the "Installing File Transfer" section of Chapter One: *Installing MiniSoft 92* for information). If your host printer is connected serially, you must add `/S` to the device name (e.g., lpt1 /s).

(System) F8 - Config Keys:

Press this key to display the set of function key labels used to access the menus for network, datacomm, terminal, special, color, and host configurations. You may also access the Config Keys function key from the Special function keys (ALT-X). For information on using the configuration keys, see Chapter Two: *Configuring MiniSoft 92*.



Special Keys (ALT-X)

Press ALT-X to display the Special menu of function keys. ALT-X does not correspond to any specific key on the 2392A or 700/92 terminals, but provides options for mode settings, file transfer, and access to all of the MiniSoft 92 configuration keys:

(Special) F1 - Modes:

Press this key to display the set of function keys used to control the operating modes (see page 40).

(Special) F2 - Quit:

Press this key to exit from MiniSoft 92.

(Special) F3 - Disconnect:

Press this key to terminate a current LAN or modem connection.

(Special) F4 - Config Keys:

Press this key to display the set of function key labels used to access the menus for network, datacomm, terminal, special, color, and host configurations. The Config function key can also be

accessed from the Special function keys (ALT-X). For information on using the configuration keys, see Chapter Two: *Configuring MiniSoft 92*.

(Special) F5 - File Transfer:

Press this key to display the File Transfer screen and function keys. For information on using the file transfer keys, see the section, "Transferring Files" in Chapter Three: *Running MiniSoft 92*.

(Special) F6 - Help:

Press this key to display a screen of MiniSoft 92 key definitions. Pressing ALT-F1 or ALT-H also displays the help screen.

(Special) F8 - Debug:

Press this key to display the set of function key labels used to trace interactions between the PC and HP host.

(Debug) **F1 - Special:**

Press this key to display the Special function keys (same as pressing ALT-X).

(Debug) **F2 - Debug Mode:**

Press this key to activate the diagnostic utility used for debugging MiniSoft 92.

(Debug) **F3 - Refresh Screen:**

Press this key to repaint the MiniSoft 92 screen.

(Debug) **F4 - Event Trace:**

Press this key to capture all interactions of an HP

application. MiniSoft can use an event trace file to find and resolve problems with the emulator.

(Debug) **F5 - Capture Packets:**
Press this key to capture packets transmitted between the PC and host through a LAN. The packet capture file is used to diagnose any problems with MiniSoft 92 and the LAN connection.

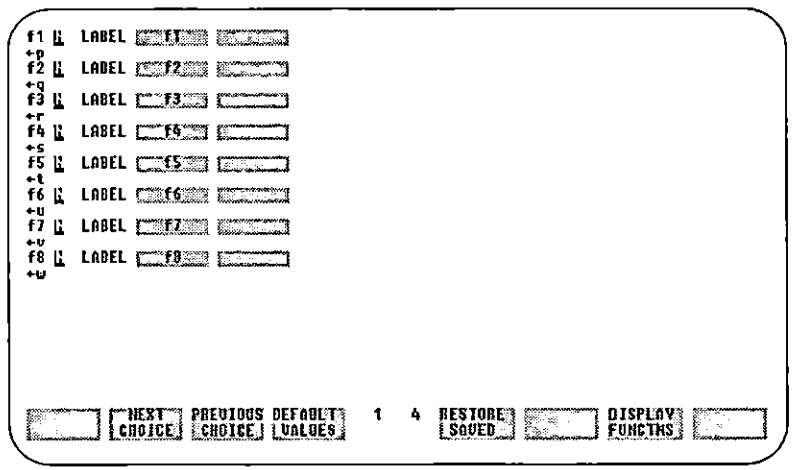
User Defined Keys (ALT-M or ALT-U)

Press ALT-M (Menu) or ALT-U (User) to load the menu of User Defined function keys. These two commands correspond to the MENU key on the 2392A and 700/92 terminals. You may define User Defined keys locally or programmatically. Default labels for these keys are *f1* through *f8*:

To get MiniSoft 92 to start up with the User Defined keys visible, specify **User** as the Initial Keys choice in the Special Configuration screen.

Programming User Defined Keys:

Press ALT-F to access the User Key Definition screen:



Program the function keys as follows:

1. Using the TAB key to move through the fields, position the cursor for the function key you wish to program (the first programmable field for each function key is the attribute field, which is defaulted to **T**).

2. Press F2 *NEXT CHOICE* or F3 *PREVIOUS CHOICE* to set the key's attribute. Attribute choices are as follows:

   T (Transmit-only): In remote mode, MiniSoft 92 transmits the user key string to the host computer after completing a block transfer handshake, automatically transmitting a carriage return. In local mode, the key has no effect.

N (Normal keyboard input): The string is treated exactly as if it had been entered from the keyboard. A carriage return is not automatically transmitted. If MiniSoft 92 is in local mode, the string is displayed on the screen, and embedded escape sequences are executed locally. In remote mode, with local echo off, the string is transmitted to the host computer, and is executed and displayed only if the host system echoes.

L (Local-only): The user key string is executed locally but is not transmitted to the host system.

3. Press TAB to move through the LABEL fields.

4. In the first LABEL field, enter up to eight characters as you want them to appear on the top line of the key's label in the function key window. If the label will continue to the second line, add this text in the second field, using the TAB key to move to that field.

   If your function key labels display only one line, MiniSoft 92 will display only what you enter in the first LABEL field.

5. Press TAB to move to the program entry field.

6. Using no more than 80 characters, enter the exact character string the user key is to generate. Include escape sequences and ASCII control codes within the string by pressing F7 *DISPLAY FUNCTNS* before entering the control codes. Disable display

functions mode immediately after entering the desired control code by pressing F7 again.

7. When you are finished defining the function keys, press ALT-M or ALT-U. The keys you defined should appear across the bottom of the screen.

   If you wish to save this set of user keys, answer Y to the "Save configuration changes?" prompt. If you wish to save the set of user keys to a different configuration file, create a file name at the "Enter File Name to save as" prompt. Otherwise, if you respond to this prompt by pressing ENTER, MiniSoft 92 saves this set of user keys to the current configuration file.

When entering data into the label and definition fields, you can use all the editing keys (INS, DEL, clear line, etc.) as if format mode were active.

Transferring Files

MiniSoft 92 incorporates its own protocol for file transfer between a PC and HP host computer. This protocol uses one of the link files described in the section, "Installing File Transfer" in Chapter One: *Installing MiniSoft 92*. The link file, also known as the "host program," resides on the host computer.

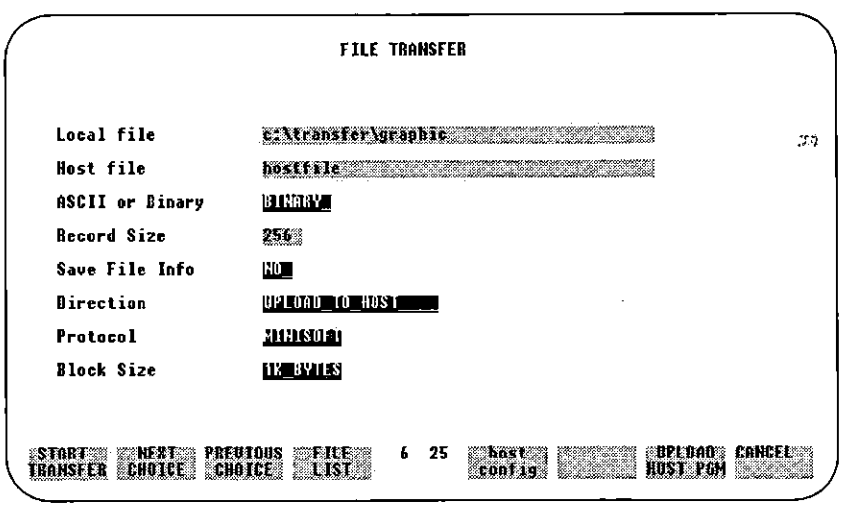
MiniSoft 92 also supports Xmodem, a file transfer protocol common to bulletin boards and Unix systems. Be sure that Xmodem also resides on the host computer before you specify it as your file transfer protocol in MiniSoft 92.

The settings you define in the Host File Transfer Configuration screen (see page 34) determine your global file transfer configuration. You may adjust these settings as needed from the File Transfer screen.

Note: For transferring large files to an HP3000, you must first create a file equation by typing at the system prompt: `FILE [filename]; DISC=[# of records]`. You may also adjust the record size in the File Transfer screen, below, to decrease the number of records needed (e.g., recsize of 512 results in half the number of records as recsize 256).

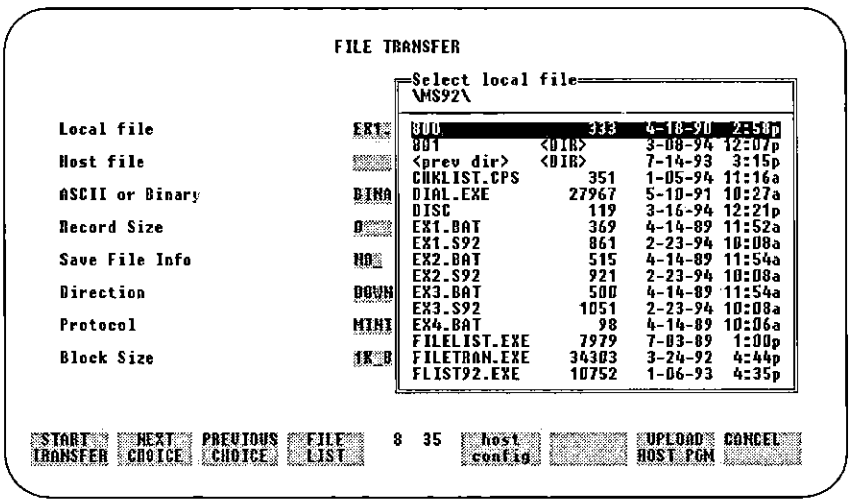
Transfer files as follows:

1. Press ALT-X to display the menu of Special function keys; then press F5 *File Transfer*. MiniSoft 92 displays the File Transfer screen:



2. Use the TAB key to move from field to field. In the Local File field, type the fully extended name of a DOS file. This is the file you are uploading (transferring to the host), or a name for a file you

are downloading (transferring from the host). To see a list of available local files, press F4 *FILE LIST* (see below). To select a file from the list, highlight it and press return. To dismiss the list, press ESC:



3. In the Host file field, type the name of a file in correct syntax for your host (e.g., lower case for Unix). This is the file you are downloading (transferring from the host), or a name for a file you are uploading (transferring to the host). Your logon area (such as group and account) is assumed; depending on your user access, you may specify a fully extended file name for a file that resides somewhere other than your logon area.

   In the sample screen in step 1, the file "graphic," which is stored on the "transfer" directory of the C drive, is being transferred to the host, where it will be named "HOSTFILE" in the user's logon group and account.

4. In the ASCII or Binary field, select either of these options for the type of file you are transferring. Select ASCII for text files and Binary for files that are program files, word processing print files, or graphics. Use F2 *NEXT CHOICE* or F3 *PREVIOUS CHOICE* to make your selection.

5. In the Record Size field, specify the record length for the file you are transferring. ASCII and binary files can have different record sizes, but a general convention is that ASCII files have a record length of 80 and binary files a record length of 256.

6. In the Save File Info field, choose whether or not to save the file information in the first 128 bytes of the destination file. Choose **YES** to save the file information and **NO** to transfer the file without saving the file information.

   If you save the file information, then the file on the final destination minicomputer will have the same file attributes (record size, block size, etc.) as the file on the original host. Saving file information is particularly useful when transferring a binary file from one minicomputer to another via a PC.

7. In the Direction field, select the direction of the file transfer. Select **UPLOAD TO HOST** to transfer a PC file to the host computer and **DOWNLOAD FROM HOST** to transfer a host file to the PC. Use F2 *NEXT CHOICE* or F3 *PREVIOUS CHOICE* to make your selection.

8. In the Protocol field, select a communications protocol supported by your host. The default choice is determined by your settings in the Host File Transfer Configuration screen, which you can access by pressing F5 *host config*. Refer to the section, "Installing File Transfer" in Chapter One: *Installing MiniSoft 92* for information on host configuration.

9. In the Block Size field, select **1K_BYTES** if you are using MS92LNK3 or MS92LNK4 host programs; select **128_BYTE** if you are using MS92LINK or MS92LNK2 host programs.

10. Press F1 *START TRANSFER*.

    MiniSoft 92 displays running statistics of the transfer: the number of bytes and the percentage of the file as it is transferred.

11. After finishing the file transfer, you may transfer another file or press F8 *CANCEL* to return to the main emulator screen. MiniSoft 92 saves your file transfer options, such as file names, ASCII/binary, and record length until you exit MiniSoft 92.

Note: The function key F7 UPLOAD HOST PGM transfers a link file to the host. You should need to use it only during installation or if you are updating your host's link file. See the section, "Installing File Transfer," in Chapter One: *Installing Minisoft 92* for more information.

Exiting MiniSoft 92

To exit MiniSoft 92, press ALT-X and then F2 *Quit*. This will return you to the DOS prompt. Ending a MiniSoft 92 session does not necessarily terminate your host session, however. Make a habit of logging off the host computer before exiting MiniSoft 92.

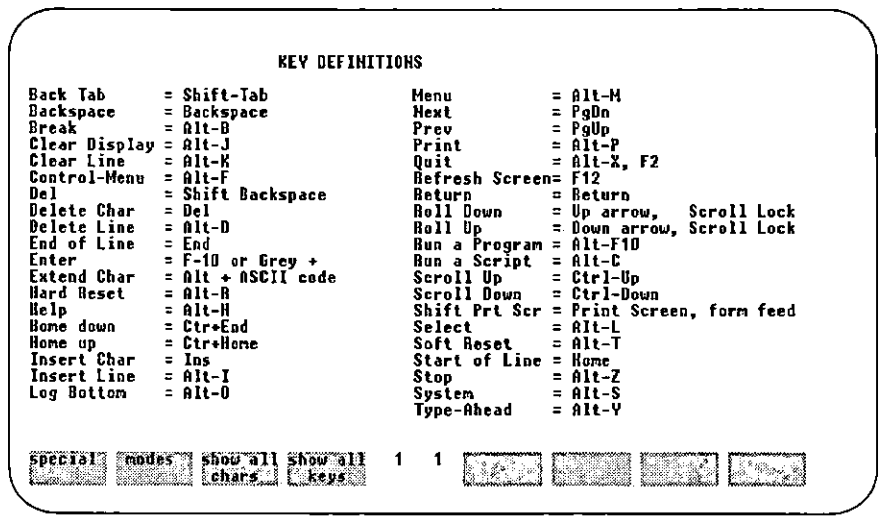
DOS Shell

To leave MiniSoft 92 temporarily and access the DOS prompt, type CTRL-F10. You may issue DOS commands and run applications at the prompt. When you are ready to return to MiniSoft 92, type `exit` in upper or lower case and press RETURN.

Note: You may not have enough memory to run some DOS applications from the DOS shell.

Help (ALT-H)

Access MiniSoft 92's help facility by pressing ALT-H. MiniSoft 92 displays a screen of commonly used key combinations:



Scrolling

Users without IBM enhanced keyboards can scroll with the cursor arrow keys by turning Scroll Lock on. MiniSoft 92 supports scrolling with the up, down, left and right cursor arrow keys. Users can also press the CTRL key and the appropriate arrow key for scrolling left, right, up, or down.

Modem Dialing

MiniSoft 92 provides support for any Hayes or Hayes compatible modem. To connect to a host computer using MiniSoft 92 and a modem, configure MiniSoft 92 to connect serially to your modem. Be sure that Remote Mode is enabled (an asterisk appears in the Remote Mode function key).

1. From the menu of configuration keys, press F3 *datacomm config.*

2. For the Baud Rate setting, choose a baud rate supported by your modem, and for the Port setting choose the com port to which your modem is attached or configured.

3. Press F1 *SAVE CONFIG* to exit from the Datacomm Configuration screen.

4. Press ALT-S to access the System keys, then press F4 *modes*. If there is no asterisk in the label for F4 *REMOTE MODE*, press F4 to activate remote mode.

You may now dial in to a host computer over the modem, as follows:

1. Type AT

   The modem should respond: OK

2. Type ATDT and the telephone number of the modem you are dialing. Do not type any spaces in the string:

   ```
   ATDT15551212
   ```

3. Press RETURN.

   The modem dials the number. You will hear a modem tone and see the message CONNECT 1200 (or whatever your baud rate is) on your screen.

4. Press RETURN to receive a prompt from the remote computer.

If OK does not display, check to see that you have specified the correct baud rate and com port. You may also want to try resetting your modem with the command ATZ (resets most modems) or AT&F (resets most modems back to their factory defaults).

Once the modem returns OK you can type ATDT and the telephone number of the modem you are dialing. MiniSoft 92 also includes a command language which you can use to automate this procedure. The command language is especially useful when you are repeatedly dialing the same modem number. Refer to *Appendix A: MiniSoft 92 Command Language* for more information on automating modem dialing.

PART TWO

Networking
MiniSoft 92

MINISOFT 92 AND LANS

Running a host session from MiniSoft 92 over your network is just like making a serial connection. You can logon, logoff, run host applications and transfer files, just as you would serially.

Switching Network Hosts

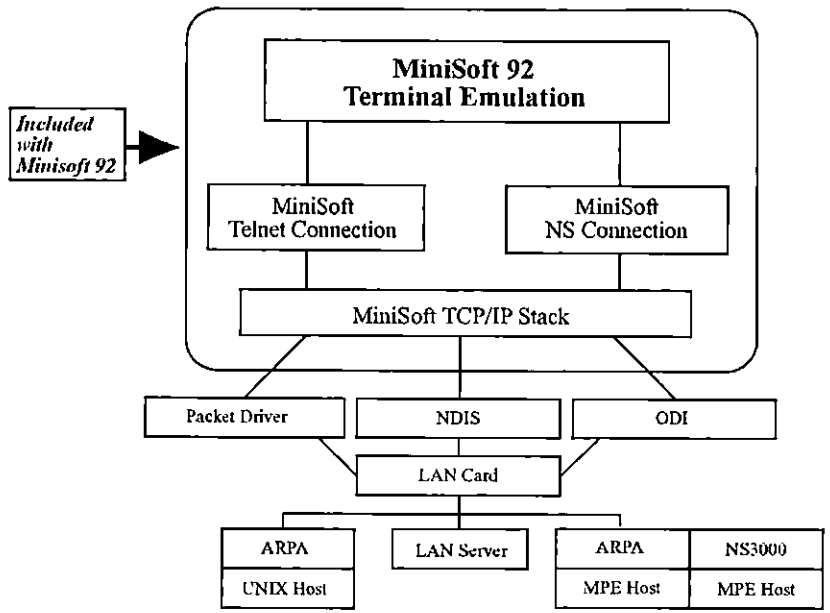
If you have another host computer on your network, you can initiate a session on it without leaving MiniSoft 92. To do this, you must disconnect from the first host by pressing ALT-X and F3 *DISCONNECT*. MiniSoft 92 displays the following message:

```
Off line. (R)etry, (C)onfigure (Q)uit.
```

- Press **R** to reconnect to the same host.
- Press **C** to display the Network Configuration screen and select another host or reset the network configuration.
- Press **Q** to exit from MiniSoft 92.

Note: You will also receive this message if your connection to the host computer is broken somehow, or if you leave MiniSoft 92 running but you do not log on to the host.

MiniSoft 92 Network Package



MiniSoft 92 supports local area networks which use the TCP/IP network transport protocol. Besides standard Hewlett Packard and Digital Equipment terminal emulation and file transfer capabilities, MS92 includes both Telnet and NS (Network Services) virtual terminal connections, as well as MiniSoft's own TCP/IP stack, as shown above.

General Requirements

In order to connect a PC to a network you need a network interface card (NIC), a network driver, a protocol stack, and application software such as MiniSoft 92. The flow of data is as follows:

NIC → Network Driver → Protocol Stack → MS92

Network Interface Card

Each PC must have a network interface card (NIC). Popular manufacturers are 3Com, Intel, Western Digital (now made by SMC), Hewlett Packard, Xircom and Cabletron.

Network Driver

Each PC on the network must have a network driver installed for its particular model NIC. As a general rule these software drivers are loaded as part of your AUTOEXEC.BAT file.

MiniSoft 92 supports three standard network drivers:

- **ODI** (Open Datalink Interface): a standard devised by Novell. ODI is a set of specifications that lets multiple communication protocols such as IPX/SPX and TCP/IP share the same driver and NIC.
- **NDIS** (Network Driver Interface Specification): a standard devised by 3Com and Microsoft which enables a NIC to access a LAN Manager

or Banyan network. NDIS allows concurrent terminal and LAN access through a single NIC.

- **Clarkson Packet Driver:** a public domain specification which allows communications programs such as MiniSoft 92 to access a NIC without the presence of a network operating system.

You can obtain the appropriate driver for your network interface card in a number of ways. Most NIC manufacturers also supply a disk that includes drivers for ODI, NDIS, and Clarkson. Many manufacturers maintain bulletin board systems (BBS) which you can access by modem and download the latest drivers. MiniSoft, Inc. maintains such a bulletin board service: see the title page of this manual for the BBS telephone number. You can also obtain ODI drivers from Novell's NOVLIB section on CompuServe. In addition, a number of Clarkson drivers are supplied with MiniSoft 92.

Protocol Stack

The protocol stack receives data from the driver, extracts the data portion of each packet, and handles other tasks, such as handshaking and error checking.

MiniSoft 92 includes its own TCP/IP stack. No separate software is required for making network connections. However, your site may already have a TCP/IP stack installed on your network. If this is the case, you do not need to install a MiniSoft device driver.

MiniSoft supports the following third party TCP/IP stacks:

Telnet Connections

PC-ARPA (HP)
LAN Workplace for DOS (Novell)
PC-NFS (Sun Microsystems)
PC-TCP (FTP Software)
Pathworks (Wollongong)

NS Connections

NS for Netware (For Novell configure MS92 for Advancenet)
NS 2.1 & 2.2 (For LAN Manager configure MS92 for Advancenet)
LAN Workplace for DOS (Novell)

Unless your PC runs one of these third party TCP/IP protocol stacks, you must install a MiniSoft network device driver on your PC in order to communicate with your host computer over a network. MiniSoft 92 includes three different device drivers; the one you install depends on the type of LAN you have:

- **ODI92:** Install this device driver if your LAN is Novell NetWare.
- **NDIS92:** Install this device driver if your LAN is LAN Manager or Banyan VINES.
- **PACK92:** Install this device driver if you are connecting to your LAN through a Clarkson Packet Driver.

Host Software

Host software is also required for either the HP3000 or HP9000. For Telnet connections, you must have a software package called ARPA Services. ARPA Services is available for both the HP9000 and HP3000.

For NS connections on MPE/iX machines, you must have Thinlan/iX (HP product number 36923A), also known as NS3000/Network Link. For NS connections on MPE-V machines, you must have LanLink-V (HP product number 30240A).

INSTALLING MS92 ON A LAN

To install MiniSoft 92 on your network, you must do the following at your PC (***Note:*** If your PC is already attached to your network, skip steps 1 and 2.):

1. Install a network interface card on your PC. Refer to the documentation that came with your card for installation instructions.

2. Install a network driver. Refer to the documentation and/or software that came with your network interface card for instructions. If you are installing a Clarkson Packet Driver, refer to the section, "Clarkson Packet Drivers" later in this chapter for information and installation instructions.

3. Install the MiniSoft device driver (***Note:*** Skip this step if your PC is already running one of the third party TCP/IP protocol stacks listed on page 62562). For specific instructions on installing the device driver for your LAN, refer to the section, "Installing

Device Drivers" in this chapter for the driver you wish to install.

4. Install MiniSoft 92 on your PC and run the application, configuring your network connection. For instructions on configuring MiniSoft 92 for LAN connections, refer to Chapter Six: *Configuring MS92 on a LAN.*

Installing Device Drivers

To install a device driver, you must copy the driver of your choice from the MiniSoft 92 installation diskette to your PC's hard drive and edit CONFIG.SYS on the PC. This section provides instructions for installing any of the MiniSoft drivers: ODI92, NDIS92, or PACK92. On the installation diskette, the driver filenames carry the extension SYS.

Refer to the following table to determine which driver you should install:

Type of LAN	Driver
ARCnet	PACK92
Banyan VINES	NDIS92
Clarkson Packet Driver	PACK92
LAN Manager	NDIS92
LANtastic	NDIS92
Novell NetWare	ODI92

Type of LAN	Driver
Token Ring	PACK92
Windows for Workgroups	NDIS92

Note: If your PC is already running one of the third party TCP/IP protocol stacks listed on page 62562, you do not need to install a MiniSoft device driver.

Installing ODI92

ODI (Open Datalink Interface) is a product from Novell that enables you to access Novell file servers and other host computers concurrently, using the same network interface card (NIC). ODI consists of a special device driver for your NIC and a program called LSL.COM (Link Support Layer) that acts as an interface between the application software and the driver. LSL examines packets received from the network and passes them to your other software, such as Novell or MiniSoft 92.

When you operate Novell under ODI, you run a program called IPXODI (Novell's ODI version of IPX), and a special version of the Novell software called NET4.COM (for DOS 4.0), or NETX.COM (a version that runs under any version of DOS.). NETX talks to the network via LSL and the ODI driver for your NIC. MiniSoft 92 also talks to the network via LSL and the ODI driver.

Install the ODI92 device driver as follows:

Note: If you have already installed MiniSoft 92 on your PC and copied the device drivers from the installation diskette, skip this step.

1. Copy ODI92.SYS from the MiniSoft 92 installation diskette to your PC's root directory or to the directory from which you wish to run it, such as c:\ms92.

```
c:\>copy a:\odi92.sys c:\ms92
```

2. Edit the following three files:
   - CONFIG.SYS
   - AUTOEXEC.BAT
   - NET.CFG

CONFIG.SYS:

Add a device statement to your CONFIG.SYS identifying the driver's path. For example:

```
DEVICE=c:\ms92\ODI92.SYS
```

AUTOEXEC.BAT:

In AUTOEXEC.BAT, add instructions to load the LSL, IPXODI and NETX drivers, along with the driver for your LAN card. LSL, IPXODI, and NETX are supplied with Netware 3.11 and 4.00 on the WSGEN diskette. Look for the ODI LAN card driver on the distribution diskette you received with your LAN card.

Load the drivers in the order shown by adding the following lines to AUTOEXEC.BAT (indicate full path designation):

```
c:\lsl
c:\<LAN card driver>
c:\ipxodi
c:\netx
```

NET.CFG:

NET.CFG is an ASCII text file that can be created with any DOS editor. Place NET.CFG in the root directory; this is where the LSL.COM program looks for it when the PC is booted up. The layout of the NET.CFG is quite specific. Please refer to the Novell manual *ODI Shell for DOS* for more information.

Following are several examples of NET.CFG files:

HPISA16 LAN Card:

```
Link Support
       Buffers 8 1500
       MemPool 4096

Link Driver HPISAODI
       Frame Ethernet_802.3
       Frame Ethernet_802.2
       Frame Ethernet_II
       Protocol IPX 0 Ethernet_802.3
       Int 5
       Mem D000
```

Intel Etherexpress LAN Card:

```
Link Support
       Buffers 8 1514
       MemPool 4096

Link Driver EXP16ODI
       Port 300
       INT 5
       Frame Ethernet_802.3
       Frame Ethernet_802.2
       Frame Ethernet_II

Protocol Stack IPX
       Bind EXP16ODI
```

NE2000:

```
Link Support
       Buffers 8 1514
       MemPool 4096

Link Driver NE2000
       Port 300
       Int 5
       Frame Ethernet_802.3
       Frame Ethernet_802.2
       Frame Ethernet_II

Protocol TCP/IP
       ip_address 192.6.1.8

Protocol Stack IPX
       Bind NE2000
```

Kodiak Noteport:

```
Link Support
       Buffers 8 1586
       MemPool 4096

Link Driver NP_ODI_S
       Int 7
       Port 1
       Frame Ethernet_II
       Frame Ethernet_802.3
       Frame Ethernet_802.2
```

SMC Elite 16:

```
Link Support
       Buffers 8 1500
       MemPool 4096

Protocol TCPIP
       ip_address 192.6.1.5

Link Driver SMCPLUS
       Port #1 300
       Frame Ethernet_II
       Frame Ethernet_802.3
       Frame Ethernet_802.2
```

3Com - 3C509:

```
Link Support
       Buffers 8 1514
       MemPool 4096

Link Driver 3C509
       Port 300
       Int 10
       Frame Ethernet_II
       Frame Ethernet_802.3
       Frame Ethernet_802.2

Protocol TCPIP
       ip_address 192.6.1.6

Protocol Stack IPX
       Bind 3C509
```

Note: If you are using a different frame type for Novell and your HP connection, you must add an additional frame type to NET.CFG. The Novell frame type should always come first. Most users will want to add all three frame statements to their NET.CFG files (Frame Ethernet_802.3, Frame Ethernet_802.2, and Frame Ethernet_II).

Installing NDIS92

NDIS (Network Driver Interface Specification) is a protocol designed by 3Com and Microsoft, under which multiple applications can share a single network interface card (NIC). Typically, you will be using NDIS if you are using a Banyan, Lantastic, or LAN Manager network and wish to connect to a Telnet or NS host computer without disconnecting from your network or rebooting.

If you have not already installed NDIS, please refer to the documentation that was included with your network

package. Install NDIS and confirm that it works with your network before you attempt to install MiniSoft 92.

Install the NDIS92 device driver as follows:

Note: If you have already installed MiniSoft 92 on your PC and copied the device drivers from the installation diskette, skip this step.

1. Copy NDIS92.SYS from the MiniSoft 92 installation diskette to your PC's root directory or to the directory from which you wish to run it, such as c:\ms92.

```
c:\>copy a:\ndis92.sys c:\ms92
```

2. Edit the following three files:
   - CONFIG.SYS
   - AUTOEXEC.BAT
   - PROTOCOL.INI

CONFIG.SYS:

1. Add a device statement to your CONFIG.SYS identifying the path of PROTMAN.SYS and PROTOCOL.INI:

```
DEVICE=<path1> PROTMAN.SYS/I:<path2>
```

   where *<path1>* indicates the directory where PROTMAN.SYS or PROTMAN.DOS is located and *<path2>* indicates the directory where PROTOCOL.INI is located.

2. Add a device statement for your particular LAN card. For example (for a Novell LAN card):

```
DEVICE=C:\NETWORKS\NE2000.DOS
```

After the driver for the LAN card there will be one or more entries for protocol drivers, such as for LAN Manager.

3. Add a device statement to your CONFIG.SYS identifying the device driver's path. For example (indicate full path designation):

```
DEVICE=c:\NDIS92.SYS
```

Note: It is important that the entry for NDIS92.SYS be placed *after* the entry for PROTMAN.SYS.

AUTOEXEC.BAT:

In AUTOEXEC.BAT, add instructions to execute NETBIND, an NDIS program that in effect tells the various drivers to exchange information and how to communicate with each other.

Note: Existing LAN Manager and Banyan users may already be loading NETBIND when booting up their LANs. Be careful not to load it twice, as an error will result.

Add the following statement to AUTOEXEC.BAT (indicate full path designation):

```
NETBIND
```

PROTOCOL.INI:

PROTOCOL.INI is an ASCII text file that can be created with any DOS editor. It lists the drivers used in your configuration of NDIS and tells them how to bind to each other. The structure of the file is as follows:

- First entry: specifies the name of the protocol manager device (loaded by the DEVICE=PROTMAN.SYS statement).
- Second entry: specifies the NDIS driver for your network interface card. The actual entry will depend on your particular LAN card and driver.
- Third entry: tells NDIS to include the MiniSoft NDIS driver. Modify the BINDINGS line to specify the name of the NDIS network card driver.

Following are several examples of PROTOCOL.INI files:

NE2000:

```
[PROTOCOL MANAGER]
      DRIVERNAME = PROTMAN$

[NE2000_NIF]
      DRIVERNAME = MS2000$
      INTERRUPT = 5
      IOBASE = 0X360

[NDIS92]
      DRIVERNAME = NDIS92$
      BINDINGS = NE2000_NIF
```

SMC Elite 16:

```
[PROTOCOL MANAGER]
      DRIVERNAME = PROTMAN$

[SMCMAC]
      DRIVERNAME = SMCMAC$
      IRQ = 5
      IOBASE = 0X300
      RECEIVEBUFSIZE = 1536

[NDIS92]
      DRIVERNAME = NDIS92$
      BINDINGS = SMCMAC
```

3C509:

```
[PROTOCOL MANAGER]
       DRIVERNAME = PROTMAN$

[ELNK_NIF]
       DRIVERNAME = ELNK3$

[NDIS92]
       DRIVERNAME = NDIS92$
       BINDINGS = ELNK_NIF
```

Once you are satisfied with your CONFIG.SYS, AUTOEXEC.BAT and PROTOCOL.INI, you should reboot your PC.

Installing PACK92

If your workstation is operating with Clarkson Packet Drivers, or if you are running under the ODI (Open Datalink Interface) specification with a packet driver (ODIPKT.COM), you should use PACK92:

Install the PACK92 device driver as follows:

Note: If you have already installed MiniSoft 92 on your PC and copied the device drivers from the installation diskette, skip this step.

1. Copy PACK92.SYS from the MiniSoft 92 installation diskette to your PC's root directory or to the directory from which you wish to run it, such as c:\ms92.

   ```
   c:\>copy a:\pack92.sys c:\ms92
   ```

2. Add a device statement to your CONFIG.SYS identifying the device driver's path. For example:

   ```
   DEVICE=c:\ms92\PACK92.SYS
   ```

Clarkson Packet Drivers

The Clarkson Packet Drivers were originally developed at Clarkson University. The Clarkson Packet Drivers provide users with a method for establishing virtual terminal connections via Ethernet without a LAN operating system being present.

The Clarkson Packet Drivers are very easy to install and have the additional advantage of consuming very little memory. MiniSoft maintains a library of the most common Clarkson drivers. They are available upon request. However many LAN card manufacturers are providing packet drivers with their LAN cards. Intel, 3Com, and SMC are three companies that supply packet drivers they have developed.

When using MS92 with a packet driver, remember to use the device driver PACK92.SYS (see page 75).

Installing a packet driver

You must run the LAN card's packet driver prior to executing MiniSoft 92. You can install the packet driver via your AUTOEXEC.BAT to cause the driver to be loaded automatically, when your PC boots up. Since each packet driver takes only a few thousand bytes, this will not take up much memory.

In order to communicate with the network interface card, the packet driver must be configured to match the jumpers on board the NIC. Many drivers determine their settings by reading the board. However, you may need to configure the settings manually through the NIC's setup software (auto-configure is possible, but

can disturb other boards). Running a packet driver with no specifications returns a "usage" message.

A partial list of packet drivers, along with its usage message and installation notes, is summarized below. All reference to network hardware addresses (source, destination and multicast) and demultiplexing information for the packet headers assumes they are represented as they would be in a MAC-level packet header being passed to the send_pkt() function.

All parameters are specified in C-style representation. Decimal is expressed as 11, hexadecimal is expressed as 0x0B, octal is expressed as 013. Any numbers echoed by the driver are in the same notation.

The first parameter is the software interrupt used to communicate with the packet driver. Before installing the packet driver, you must choose a software interrupt number in the range between 0x60 and 0x80. Some of these interrupts are used for other purposes, so your first choice may not work.

3Com 3c501

```
usage: 3C501 <packet_int_no> <int_no> <io_addr>
```

The 3c501 driver requires two additional parameters: the hardware interrupt number and the I/O address. The defaults are 3 and 0x300.

3Com 3c503

```
usage: 3C503 <packet_int_no> <int_level(2-5)>
   <io_addr> <cable_type>
```

The 3c503 driver requires three additional parameters: the hardware interrupt number, the I/O address, and the cable type. The 3c503 can be attached to thick or thin Ethernet cables, and the selection is made in software.

The cable type parameter should be 0 for thick, and 1 for thin. The defaults are 2, 0x300, and 1 (thin). The 3c503 uses shared memory whose address is set by jumpers, but the software can ask the board what the address is.

3Com 3c505

```
usage: 3c505 <packet_int_no> <int_no> <io_addr>
   <base_addr>
```

The 3c505 driver requires three additional parameters: the hardware interrupt number, the I/O address, and the memory base address. The defaults are 2, 0x300 and 0xd000.

3Com 3c507

```
usage: 3c507 <packet_int_no> <int_no> <io_addr>
   <base_addr>
```

The 3c507 will determine its parameters by reading the board. The only time you would need to specify the parameters is when you have multiple 3c507s in the same machine. The 3c507 driver will use three additional parameters: the hardware interrupt number, the I/O address, and the memory base address.

HP EtherTwist/Starlan10/ThinLan

```
usage: hppclan <packet_int_no> <int_no>
   <io_addr>
```

The hppclan driver supports 8 and 16 bit HP LAN cards based on the National 8390 chip. Earlier HP LAN cards should use the 3Com 3c501 driver. The hppclan driver requires two additional parameters: the hardware interrupt number and the I/O address. The defaults are 3 and 0x300. On IBM PS/2 Microchannel machines, the defaults are read from the PS/2 configuration.

NOVRAM and additional parameters are not normally required.

Novell ne1000

```
usage: ne1000 <packet_int_no> <int_no> <io_addr>
```

The ne1000 driver requires two additional parameters: the hardware interrupt number and the I/O address. The defaults are 3 and 0x300.

Novell ne2000

```
usage: ne2000 <packet_int_no> <int_no> <io_addr>
```

The ne2000 driver requires two additional parameters: the hardware interrupt number and the I/O address. The defaults are 2 and 0x300.

Western Digital WD8003 E EBT EB ET/A and E/A

```
usage: WD8003E <packet_int_no> [-o ] <int_level>
   <io_addr> <mem_base>
```

The WD8003E driver runs the Western Digital E, EBT, EB, ET/A, and E/A Ethernet cards. The WD8003E requires three additional parameters: the hardware interrupt number, the I/O address, and the memory base address. The defaults are 2, 0x280 and 0xd000. The WD8003E cards do not enable their memory until configuration time. Some 386 memory mappers will map memory into the area that the card intends to use. You should be able to configure your software to leave this area of memory alone. Also the driver will refuse to map memory into occupied memory. The occupied memory test fails on some machines, so the optional switch -o allows you to disable the check for occupied memory.

Running ODI with packet drivers

MiniSoft 92 includes the packet driver ODIPKT.COM which allows users of the Clarkson Packet Drivers to run under the ODI (Open Datalink Interface) specification. The ODIPKT packet driver provides a packet driver interface over Novell's ODI, allowing a single network adapter service for IPX, TCP/IP, and other protocol stacks which use packet drivers.

MiniSoft 92 users wishing to operate with the ODIPKT packet driver should install the device driver PACK92 (see page 75).

Install the ODIPKT packet driver and PACK92 device driver as follows:

1. Copy ODIPKT.COM and PACK92.SYS from the MiniSoft 92 installation diskette to your PC's root directory or to the directory from which you wish to run it.

```
c:\>copy a:\odipkt.com
c:\>copy a:\pack92.sys
```

2. Edit the following three files:
   - CONFIG.SYS
   - AUTOEXEC.BAT
   - NET.CFG

CONFIG.SYS:

Add a device statement to your CONFIG.SYS identifying the device driver's path. For example:

```
DEVICE=c:\pack92.SYS
```

AUTOEXEC.BAT:

In AUTOEXEC.BAT, add instructions to load the LSL, IPXODI, NETX and ODIPKT drivers, along with the driver for your LAN card. LSL, IPXODI, and NETX are supplied with Netware 3.11 and 4.00 on the WSGEN diskette. ODIPKT is the driver supplied by MiniSoft, which you just copied to your PC. Look for the ODI LAN card driver on the distribution diskette you received with your LAN card.

Load the drivers in the order shown by adding the following lines to AUTOEXEC.BAT (indicate full path designation):

```
c:\lsl
c:\<LAN card driver>
c:\ipxodi
c:\netx
c:\odipkt [<parm>]
```

where the optional parmaeter <parm> is none (0), 1 or 2, depending on the frame type you will specify in MS92's Network Configuration screen. To determine which parameter to use, you must also know the frame types listed in your NET.CFG and their order. For example, all three frames may be listed in your NET.CFG:

```
Frame Ethernet_802.3
Frame Ethernet_802.2
Frame Ethernet_II
```

The first frame type listed is the default. You would load ODIPKT with no parameter if you wanted to use this frame type. The second frame type listed in NET.CFG is considered the first alternative, and you would load ODIPKT with a parameter of 1 to use this frame type. The third frame type listed is considered

the second alternative, and you would load ODIPKT with a parameter of 2 to use this frame type.

For example, based on the order of the frame statements above, if you select Frame Ethernet II in MS92's Network Configuration screen (see Chapter Six: *Configuring MS92 on a LAN*), you should load ODIPKT with a parameter of 2 (`odipkt 2`). If you select Frame Ethernet 802.3, load ODIPKT with a parameter of 1 (`odipkt 1`).

CONFIGURING MS92 ON A LAN

This chapter explains how to configure MiniSoft 92 for your LAN.

1. Execute MiniSoft 92. From the initial screen, press ALT-X to access the Special function key menu.

2. Press F4 *config keys*, and then F7, *network config*. The Network Configuration screen displays.

3. Use the F2 *NEXT CHOICE* and F3 *PREVIOUS CHOICE* keys to select your network type in the Network Type field.

4. Press RETURN or TAB to move to the configuration fields for your network. For details on configuring your network, refer to the section of this chapter that describes your LAN.

5. When you are satisfied with your configuration, press F1 *SAVE CONFIG*. The screen repaints itself

and a host connection is established. Remember, when you go to "quit" your MiniSoft 92 session, to save the changes you made to the configuration file.

Configuring for Telnet

MiniSoft 92 supports LAN connections to an HP host computer via the Telnet virtual terminal protocol. The HP host computer must be operating with ARPA services.

You have three choices for making a Telnet connection through MS92's TCP/IP stack:

- **Clarkson Packet Driver:** Select this option to connect via the packet drivers or when using ODIPKT.COM (Packet to ODI converter) for making ODI connections with the Packet Driver networking specification. Use the PACK92 device driver with this choice.
- **ODI:** Select this option to make ODI connections with the ODI92 device driver. Recommended for use with the Novell LAN operating system.
- **NDIS:** Select this option to make NDIS connections with the NDIS92 device driver. Recommended for use with LAN Manager, Banyan, and Lantastic LAN operating systems.

MS92 also supports Telnet connections through several third party TCP/IP stacks including:

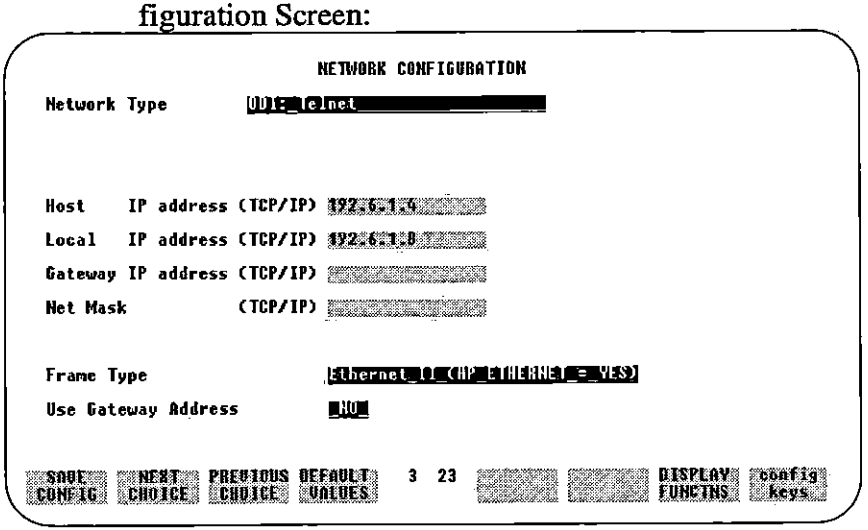
- **LAN Workplace for DOS:** Select this option to make Telnet connections over Novell's TCP/IP stack. For more information regarding

LAN Workplace, refer to the "Configuring for LAN Workplace for DOS" section of this chapter.

- **FTP:** A common choice for Banyan users who want to make Telnet connections with PCTCP. Support for this stack is not featured in the standard MS92 package. You must request the "FTP" version of MS92 to receive it.
- **BAPI:** A common interface supported by most third party TCP/IP stacks.
- **PCNFS:** Produced by SUN, this stack is not featured in the standard MS92 package. Request the PCNFS version of MS92 from MiniSoft.

Network Configuration screen: Telnet

Access the Network Configuration screen by pressing ALT-X, then F4 *config keys*, and F7 *network config*. Make your configuration settings in the Network Configuration Screen:



1. **Network Type:** Use F2 *NEXT CHOICE* and F3 *PREVIOUS CHOICE* to select a Telnet choice (e.g., **ODI:_Telnet**). Use the tab key to move from field to field.

2. **Host IP address (TCP/IP):** enter the IP address of your host computer system (e.g., `192.6.1.4`). If you use the Clarkson Packet Driver, NDIS, or ODI selections you *must* put in the IP address of your host computer.

3. **Local IP address (TCP/IP):** enter your workstation's particular IP address (e.g., `192.6.1.8`). This address must be unique. Using a duplicate address will prevent a connection from being established. MS92 will also return the error "Connection failed."

4. **Gateway IP address (TCP/IP):** This is used with multiple networks where routers or bridges exist. A bridge is a device connecting two or more networks of the same physical type. Gateways have two IP addresses. Enter the IP address that is on the same sub-net as your PC. Leave this field blank if only one network is being used.

5. **Net mask (TCP/IP):** enter the network mask (e.g., `255.0.0.0`).

6. **Frame Type:** select **Ethernet_II_(HP_ ETHERNET_=_YES)**.

7. Press F1 *SAVE CONFIG* to activate your network configuration.

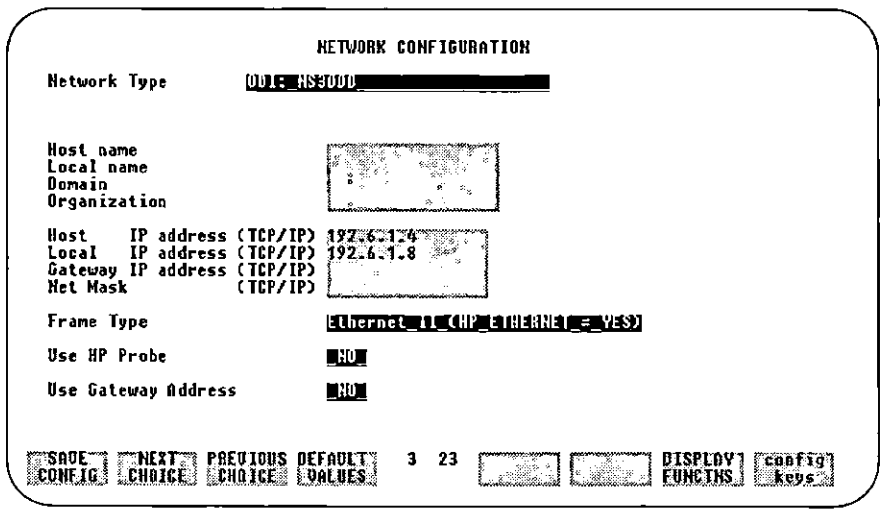
Configuring for Network Services

MiniSoft 92 supports LAN connections to an HP3000 host computer via the NS (Network Services) protocol. The HP3000 host computer must be operating with Thinlan/XL or the host component of NS. You have four choices for making an NS connection in MS92:

- **Clarkson Packet Driver:** Select this option to connect via the packet drivers or when using ODIPKT.COM (Packet to ODI converter) for making ODI connections with the Packet Driver networking specification. Use the PACK92 device driver with this choice.
- **ODI:** Select this option to make ODI connections with the ODI92 device driver. Recommended for use with the Novell LAN operating system.
- **NDIS:** Select this option to make NDIS connections with the NDIS92 device driver. Recommended for use with LAN Manager, Banyan, and Lantastic LAN operating systems.
- **LAN Workplace for DOS:** Select this option to make NS connections over Novell's TCP/IP stack. For more information regarding LAN Workplace, refer to the "Configuring for LAN Workplace for DOS" section of this chapter.

Network Configuration Screen: NS3000

Access the Network Configuration screen by pressing ALT-X, then F4 *config keys*, and F7 *network config*. Make your configuration settings in the Network Configuration Screen:



1. **Network Type:** Use F2 NEXT CHOICE and F3 PREVIOUS CHOICE to select an NS choice (e.g., **ODI:_NS**). Use the tab key to move from field to field.

2. **Host name, Domain,** and **Organization:** An easy way to determine the three-part host computer name is to type NETCONTROL STATUS on the HP console terminal. Network Services will display the current Host name, Domain and Organization. These fields are *required* if the Use HP Probe field is **YES** and your Frame Type is **IEEE_802.3**.

3. **Local name:** enter your local name. This field is optional.

4. **Host IP address (TCP/IP):** a required field unless you are connecting via HP Probe. You may leave this field blank if the Use HP Probe field is **YES**. This field is *required* if the Use Gateway Address field is **YES**.

5. **Local IP address (TCP/IP):** enter the workstation's particular IP address (e.g., `192.6.1.8`). The Local IP address must be unique for each workstation. This field is *required*.

6. **Gateway IP address (TCP/IP):** enter a specific address if you are using a router to tie multiple LANs together. If you use a gateway, you must also specify a Host IP address, and you should select **YES** in the Use Gateway Address field.

7. Net Mask: enter the network mask (e.g., `255.0.0.0`).

8. **Frame Type:** select **Ethernet_II_(HP_ETHERNET_=_YES)** when the Enable Ethernet field located under NMMGR is set to **YES**. If the Enable Ethernet field is set to **NO**, select **IEEE_802.3_(DEFAULT_FOR_HP3000)** in the Frame Type field. Determine the configuration of the Enable Ethernet field through the host configuration file NMCONFIG.PUB.SYS. Make any changes to this configuration file through the network manager program NMMGR.

Note: If the HP Probe field is YES you will always select the frame type "IEEE_802.3". When this field is NO select the "Ethernet_II" frame type.

9. Press F1 *SAVE CONFIG* to activate your network configuration.

Configuring for LAN Workplace for DOS

MiniSoft 92 supports LAN Workplace for DOS (TCPIP.EXE) version 4.1 (revision number 930614) or later. If this software is not already installed, consult the Novell *LAN Workplace for DOS User's Manual* for instructions on installing LAN Workplace.

Using LAN Workplace for DOS, you may run host sessions in MiniSoft 92 over Ethernet, Token Ring, or ARCnet networks, supporting both Telnet and NS.

Host configuration:

In order to connect to your HP host computer over LAN Workplace, you must have the appropriate patch from Hewlett Packard:

MPE-V operating system:

Release	*Patch*
23	NS patch NSANT7 or later
2P	NS patch NSANT7 or later
30	no patch needed

MPE/iX operating system:

Release	*Patch*
4.0	NS patch NSTCDK7 or later

Release	*Patch*
4.5	NS patch NSTCDK7 or later
4.7	no patch needed
5.0	no patch needed

HP/UX operating system:
ARPA services must be installed to make Telnet connections. Currently, no patches are required.

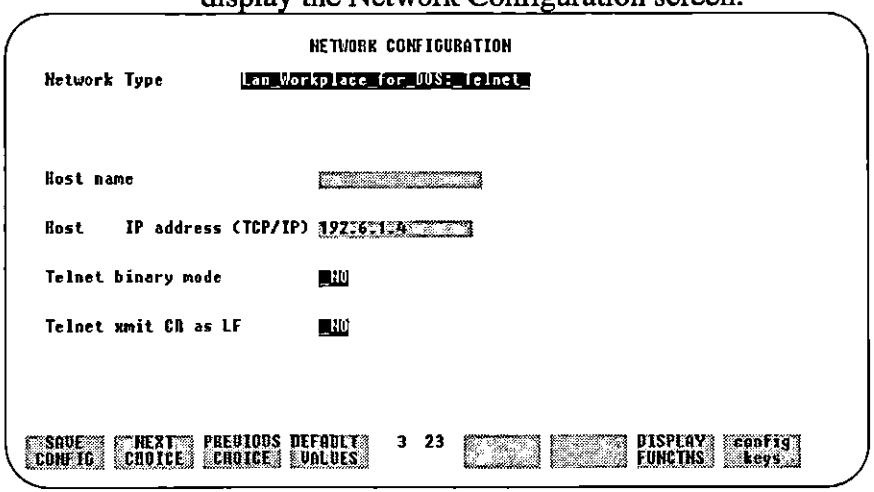
If you are connecting to an HP3000 over an Ethernet LAN, be sure that Ethernet II is enabled on your host.

MiniSoft 92 configuration:

If you have just installed LAN Workplace for DOS on your workstation, reboot the machine before configuring MiniSoft 92, as follows:

1. Run MiniSoft 92, and press ALT-X to access the menu of Special function keys.

2. Press F4 *config keys* and then F7 *network config* to display the Network Configuration screen:



3. Use the F2 *NEXT CHOICE* or F3 *PREVIOUS CHOICE* key to select **LAN Workplace for DOS: NS3000** or **LAN Workplace for DOS: Telnet** as your Network Type.

4. Enter your host computer's name, if one exists, in the Host name field (This field is optional.).

5. Enter your host computer's IP address in the Host IP address field (This field is required.).

6. If you are making a Telnet connection, you must also configure whether or not you want to use binary mode and whether or not you want carriage returns to be transmitted as line-feeds (Default for both options is **No**.).

7. Press F1 *SAVE CONFIG* to activate the configuration.

Note: If you do not get a system prompt from your host computer and no error messages are reported, you are probably running with an older version of LAN Workplace. Update your LAN Workplace software before configuring MiniSoft 92.

Other connections

Besides the network connections you may make using MiniSoft's TCP/IP stack or LAN Workplace for DOS, the Network Configuration screen also allows you to configure MiniSoft 92 for NACS, HP Advancenet, Interrupt 14, Harris, Banyan, Ungermann-Bass, and BAPI connections.

The primary ones, NACS and HP Advancenet, are documented here.

NACS (Novell Asynchronous Communication Server)

Before loading NACS, identify your specific and general names. Follow the steps below to configure MS92 for NACS:

1. Load NACS on the server:

```
:LOAD COMMEXEC
CS> CSLOAD NACS
```

2. Confirm the available ports as follows:

```
CS> CSSTATUS
```

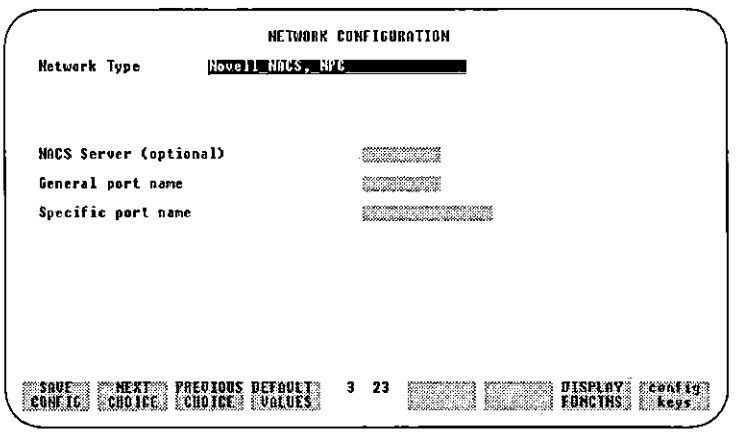
[menu] select: **Display Status for Service**
[menu] select: **NACS**

3. Enter the NACS password (default is NEWPASS):

[menu] select: **NACS Port Information**

This option displays your NACS ports with their specific and general names and whether they are currently in use. If they are in use, the name of the user is displayed. Use this information to configure MS92 for NACS.

4. Access the Network Configuration screen by pressing ALT-X, then F4 *config keys*, and F7 *network config*.



5. Key in the NACS Server (optional), the General port name, and a Specific port name. Press F1 *SAVE CONFIG* to activate the connection.

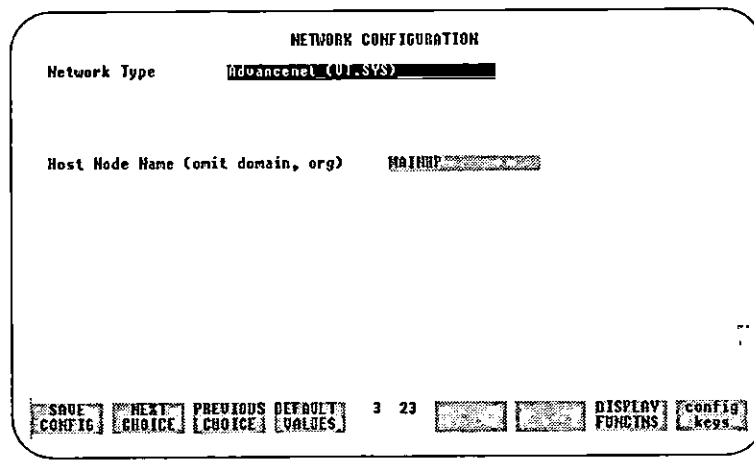
Advancenet

MiniSoft 92 supports LAN connections to an HP host computer via HP Advancenet. HP Advancenet will allow you to make a LAN connection using Hewlett Packard's TCP/IP stacks (NS for NetWare or NS 2.1).

NS for NetWare is a Hewlett Packard TCP/IP stack designed to operate with Novell version 3.11 and above. NS 2.1 is a Hewlett Packard TCP/IP stack designed to operate with LAN Manager. Either software package enables MiniSoft 92 to communicate via Network Services (NS) as a virtual terminal to an HP3000 host operating Thinlan/XL or its equivalent.

To make an HP Advancenet connection:

1. Access the Network Configuration screen by pressing ALT-X, then F4 *config keys*, and F7 *network config*.



2. In the Host Node Name field, enter the host name (e.g., MAINHP)

3. Press F1 *SAVE CONFIG* to activate the configuration.

Utilities

MiniSoft 92 includes two LAN utility programs that allow the LAN administrator to create and modify MS92 configuration files (.CFG). These utility programs are particularly useful for large networks with many connections.

Netshow

Netshow reads the configuration file MS92.CFG and displays its contents to the screen. At the DOS prompt, in the directory where MiniSoft 92 is stored, type NETSHOW and press RETURN. The contents of MS92.CFG are displayed:

```
c:\ms92\netshow
local name
local ip 192.6.1.8
host ip 192.6.1.4
Gateway ip
```

Netmod

Netmod updates the configuration file MS92.CFG from the parameters passed to the program. For example:

```
NETMOD MY.NAME.HERE 123.4.5.6. 123.4.5.7
123.4.5.8
```

PART THREE

Appendixes

APPENDIX A

MS92 COMMAND LANGUAGE

MiniSoft 92 features a powerful script language which you can use to automate many repetitive and time consuming tasks. A script language is an excellent way to automate all or part of a communications session by building a file that contains a sequence of commands. For example, you can build a script of commands that will dial up a computer through a modem, transmit a logon, wait for a password prompt, and submit a password. By creating a script file you save yourself time and effort in connecting to a host computer.

Script files are text files that you create with a text editor or a word processor. If you use a word processor, remember to save the files in ASCII form. Script files should always have the file extension .S92.

You can execute a MiniSoft 92 script file in several ways:

- automatically, when the program MiniSoft 92 loads

- via host commands, which are used to initiate script files
- manually from within MiniSoft 92

Automatic execution

Use the parameter `S=<scriptname>`. For example, to run a script called CONNECT.S92, enter:

```
MS92 S=CONNECT.S92
```

If the script file itself takes parameters, add the parameters after the name of the script file. For example:

```
MS92 S=CONNECT.S92 PARM1 PARM2 PARM3
```

The script file name and its parameters must come at the end of the command line. For example, you would place the name of configuration file *before* the name of the script file:

```
MS92 MINISOFT.CFG S=MINICON.S92 PARM1 PARM2
```

Execution via Host commands

MiniSoft 92 interprets the escape sequence `[ESC]&oC[cmd] [CR]` as follows:

- If `cmd` is a script language command, MiniSoft 92 will execute that command. For example:

  `[ESC]&oCTELL YOU ARE NOW CONNECTED[CR]`

- If `cmd` is not a script language command, MiniSoft 92 will look for a script file with that name and run it. The PC replies `S` for Success, `F` for Failure. The PC's reply is implemented as a type 3 block transfer, meaning that it will normally require a DC1 before responding.

Manual execution

You can run a script from within MiniSoft 92 by pressing ALT-C. MiniSoft 92 will prompt you for the name of a script file to run.

```
Enter name of script to run. Press 'ESC' to
quit.
```

Passing Parameters to Scripts

You can make your script files more generic by using run-time parameters. These work in a similar way to DOS batch file parameters. For example, suppose you wrote a script file called SENDIT.S92. To have the script transmit the same file each time you could write:

```
LOCF MYFILE.FIL
HOSTF MYFILE
RECSIZE  256
BINARY
UPLOAD
```

To transmit a different file each time you could write:

```
LOCF %1
HOSTF %2
RECSIZE 256
BINARY
UPLOAD
```

You could then tell the script file to upload the local file NEW.FIL to the host file NEWFIL as follows:

```
MS92 S=SENDIT.S92 NEW.FIL NEWFIL
```

MS92 will replace the entry %1 in the script with the first parameter (NEW.FIL) appearing after the name of the script file, and the entry %2 with the second parameter (NEWFIL).

You could write a host escape sequence to do the same thing as follows:

```
[ESC]&oCSENDIT.S92 NEW.FIL NEWFIL
```

Script Language Commands

Script files consist of a series of commands, each on a separate line. The commands are summarized below:

Sending and Receiving

NEXTC

Waits for the next character to be received or until the time specified in the last TIMER command has elapsed with no characters being received.

SEND `str`

transmits the string `str` followed by a carriage return.

TRANSMIT `"string"`

Transmits the string in quotes. A carriage return is **not** included. To include a control character in the string, precede the character with a caret (^).

TRANSMIT `variable`

Transmits the contents of the named variable.

WAITC `c`

Waits until the character whose ASCII code is `c` is received or until the time specified in the last TIMER command has elapsed with no characters being received.

WAITS `str`

Waits until the string `str` is received or until the

time specified in the last TIMER command has elapsed with no characters being received.

XMITC `c`
Transmits the character whose ASCII code is `c` without adding a carriage return.

XMITS `str`
Transmits a string `str` without adding a carriage return.

Communication with the User

ACCEPT `variable`
Accepts keyboard input from the user and puts it in the named variable.

ASK `str`
Presents a message box to the user with the message `str`, and waits for the user to press **Y** or **N**.

BEEP
Sounds the PC alarm.

DISPLAY `"string"`
Displays the string on the emulation screen.

DISPLAY `variable`
Displays the contents of the named variable on the emulation screen.

TELL `str`
Presents a message box to the user with the message `str`, and waits for the user to press a key.

Program Flow

ELSE
Marks the start of execution if the previous IF statement's condition is not true.

END
Marks the end of the script file.

ENDIF
Marks the end of an IF statement.

GOTO `lab`
Jumps to the line in the script file that has the label `lab`.

GOSUB `lab`
Executes a subroutine which starts with the line labeled by `lab`. After the subroutine executes a RETURN statement, execution resumes at the statement following the GOSUB.

IFYES `lab`
Jumps to the line in the script file labeled `lab` if the user answered **Y** to the last ASK command.

IFC `c lab`
Jumps to the line with the label `lab` if the character received by NEXTC is `c`.

IF `condition`
Executes the commands immediately following the IF if the condition is true. Comparisons between strings, numbers, and/or variables can be made with the following symbols: = <> > < <= >=. Multiple comparisons can be combined with AND and OR, provided the comparisons are enclosed in

parentheses. For example:

```
IF (V1 = "Test") AND (V2 <> 0)
```

If the condition is not true, then execution continues, following the next matching ELSE or ENDIF. IF statements can be nested, as long as each IF has a corresponding ENDIF.

LABEL `lab`
or

:LAB
Assigns `lab` as the name of this line. You will then be able to use other instructions to jump to that line.

ONTIMER `lab`
Jumps to the label `lab` when the timer goes off.

RETURN
Returns from a subroutine called with the GOSUB command.

STOP
Stop execution of the script file.

File Transfer Commands

ASCII
File transfer is ASCII.

BINARY
File transfer is binary.

DOWNLOAD
Receive `LOCF` from `HOSTF`.

HOSTF `name`
Host file is `name`.

LOCF `name`
Local file is `name`.

RECEIVE
Downloads a file from a host to a PC. For example:

```
RECEIVE locf FROM hostf [ASCII]
```

Substitute the name of the PC file for `locf` and the name of the host file for `hostf`. If you omit `ASCII`, the file will be transferred as a binary file. You must set a record size before using the RECEIVE command (see RECSIZE).

RECSIZE `n`
Record size is `n` bytes.

SAVINF
Saves the file header information.

UPLOAD
Transmits `LOCF` to `HOSTF`.

Miscellaneous Commands

;COMMENT
This is a comment line. It is not executed.

BREAK
sends a break to the host computer.

DISCONNECT
Terminates the connection.

EXIT n

Exits MiniSoft 92 with a return value of n.

HARDEXIT n

Exits MiniSoft 92 with a return value of n.

LET variable = expression

Assigns the name variable to the value expression. Numeric expressions can contain numeric constants and functions combined with the following operators: * / + -. String expressions can contain string constants or calls to string functions.

LOAD fname

Loads a configuration file with name fname.

MAPKEY key1 key2

Transmits key2 when key1 is pressed. Use ASCII codes for ASCII characters; for non-ASCII character keys (e.g., F4, SHIFT), use the scan code preceded by a minus sign. For example, MAPKEY -62 24 causes the F4 key to transmit ^X(24). For a list of scan codes, consult a complete ASCII key code table for your keyboard.

NOBREAK

Prevents a user from interrupting the execution of a script.

QUIT

Exits MiniSoft 92.

SAVE fname

Save the configuration to a file with the name fname.

TABLOAD n fname

Loads alternate translation tables without having to exit MiniSoft 92. Parameter n indicates the type of

character set translation:

1 - Emulation, keyboard to host.
2 - Emulation, host to keyboard.
3 - ASCII file transfer, to host
4 - ASCII file transfer, to PC

Parameter `fname` indicates translation table to load.

Example:
```
TABLOAD 1 PC8SWE7.TBL
```

loads the file PC8SWE7.TBL to translate keyboard input characters to the host character set.

TIMER `val`
Sets a timer for `val` seconds. The timer starts upon the execution of the next WAITC, WAITS or NEXTC command.

TRACE
Displays script commands as they are executed.

Functions

FIND `(string1,string2)`
Returns the starting position of `string1` in `string2`. The first position in `string2` is 1. FIND returns 0 if `string1` is not found in `string2`.

LENGTH `(string)`
Returns the number of characters in string.

LOWER `(string)`
Returns a copy of `string` with all upper case characters in the string changed to lower case.

MID (string,start,end)
Returns the characters in string from the positions between and including start and end.

SCREENFIELD
(string,length,startrow,startcol)
Searches for string on the display starting at startrow and startcol and returns a string of length characters immediately following the string. Startrow and startcol are optional. The first row and first column are numbered 0.

SCREENFIND (string,startrow,startcol)
Returns the row number that string is found on the display. The search is started at startrow and startcol.

SCREENRECT (startrow,startcol,endrow,endcol)
Returns all the characters bounded by the rectangle defined by startrow, startcol, endrow, and endcol.

UPPER (string)
Returns a copy of string with all lower case characters in the string changed to upper case.

Predefined Variables

$DATE
The current date.

$TIME
The current time.

Note: If you encounter the error "Invalid Script Line" while executing any MiniSoft 92 scripts check to make sure that the last line of your script contains the END command. This command is designed to terminate the script.

Script Examples

The MiniSoft 92 installation diskette contains several sample script files. Some of them are shown here.

Example 1 (EX1.S92)

This example dials an HP3000 host through a Hayes compatible modem and logs in.

```
# This example calls an HP3000 and logs in.
# If the host does not answer the user is
  prompted to retry.
LABEL DIAL
# dial a number
SEND ATDT15551212
# set timer to 40 seconds
TIMER 40
# go to label noanswer if timer expires
ONTIMER NOANSWER
# wait for modems to connect
WAITS CONNECT 2400
LABEL CR
# send a carriage return
XMITC 13
# set timer to 5 seconds
TIMER 5
# go to label cr if timer expires
ONTIMER CR
# wait for prompt from host
WAITS :^Q
# send login command
SEND HELLO MGR.MINISOFT
# wait for password prompt from host
WAITS PASSWORD:^Q
# send password
SEND ANYPW
# wait for prompt from host
WAITS :^Q
GOTO FINISH
LABEL NOANSWER
# send a carraige return to reset modem
XMITC 13
# prompt user for retry
ASK NO ANSWER, REDIAL?
# if user want to retry go to label dial
IFYES DIAL
LABEL FINISH
END
```

Example 2 (EX2.S92)

This example dials an HP3000 and logs in and runs an application.

```
# This example calls an HP3000 and logs in and
  runs an application.
# If the host does not answer the user is
  prompted to retry.
LABEL DIAL
# dial a number
SEND ATDT15551212
# set timer to 40 seconds
TIMER 40
# go to label noanswer if timer expires
ONTIMER NOANSWER
# wait for modems to connect
WAITS CONNECT 2400
LABEL CR
# send a carriage return
XMITC 13
# set timer to 5 seconds
TIMER 5
# go to label cr if timer expires
ONTIMER CR
# wait for prompt from host
WAITS :^Q
# send login command
SEND HELLO MGR.MINISOFT
# wait for password prompt from host
WAITS PASSWORD:^Q
# send password
SEND SKINOW
# wait for prompt from host
WAITS :^Q
# run the application
SEND EDITOR
GOTO FINISH
LABEL NOANSWER
# send a carraige return to reset modem
XMITC 13
# prompt user for retry
ASK NO ANSWER, REDIAL?
# if user want to retry go to label dial
IFYES DIAL
LABEL FINISH
END
```

Example 3 (EX3.S92)

This example dials an HP3000 through a Hayes compatible modem, logs in, transfers a file, and logs off.

```
# This example calls an HP3000 and logs in,
  transfers a file, and logs off.
# If the host does not answer the user is
  prompted to retry.
LABEL DIAL
# dial a number
SEND ATDT15551212
# set timer to 40 seconds
TIMER 40
# go to label noanswer if timer expires
ONTIMER NOANSWER
# wait for modems to connect
WAITS CONNECT 2400
LABEL CR
# send a carriage return
XMITC 13
# set timer to 5 seconds
TIMER 5
# go to label cr if timer expires
ONTIMER CR
# wait for prompt from host (CTRL Q)
WAITC 17
# send login command
SEND HELLO MGR.MINISOFT
# wait for password prompt from host
WAITS PASSWORD:^Q
# send password
SEND ANYPW
# wait for prompt from host (CTRL Q)
WAITC 17
# specify local and host file, then start upload
LOCF C:\DATA\BUDGET.DAT
HOSTF BUDGET.DATA.MINISOFT
BINARY
RECSIZE 256
UPLOAD
GOTO FINISH
LABEL NOANSWER
# send a carraige return to reset modem
XMITC 13
# prompt user for retry
ASK NO ANSWER, REDIAL?
# if user want to retry go to label dial
IFYES DIAL
LABEL FINISH
SEND BYE
END
```

Example 4

This example logs on automatically to an HP9000.

```
LABEL SENDBREAK
XMITC 4
XMITC 13
TIMER 5
ONTIMER SENDBREAK
WAITS login:
GOTO SENDID
LABEL LOGINAGAIN
WAITS login:
LABEL SENDID
SEND dave
TIMER 5
ONTIMER LOGINAGAIN
WAITS Password:
SEND password
XMITC 13
END
```

Host Initiated File Transfer

A host program can initiate a file transfer in MiniSoft 92 by issuing a sequence of host initiated commands with the escape sequence (`esc&oC <command>cr`). The sequence of commands would be as shown in this example:

```
esc&oCLOCF <pcfilename>cr

esc&oCHOSTF <hostfilename>cr

esc&oCASCIIcr

esc&oCUPLOADcr
```

After each of the escape sequences is sent to MS92 (except for the UPLOAD or DOWNLOAD), the host program must read the device completion code from MS92. It will be either **S** for success or **F** for failure. After the UPLOAD or DOWNLOAD is issued, the host program must read the RUN statement that will be

issued by MS92. When the host program receives the RUN statement, it must use the CREATEPROCESS and ACTIVATE intrinsics to RUN the named program (typically MS92LINK.PUB.SYS). When the named program has terminated, the host program must then read the device completion code from MS92.

The MiniSoft 92 installation diskettes include two examples of host initiated file transfer. One example, **PCFTS.CI** is an MPE/iX command file. The other example, **PCFTS.COB**, is written for the COBOL II compiler on MPE-V or the COBOL compiler on MPE/iX. To use it as a template, use the statements pertaining to MPE-V or MPE/iX and comment out the others. Be sure to PREP or LINK your host program with PH capability, which is required to use the CREATEPROCESS and ACTIVATE intrinsics.

MPE/iX Command File Example

```
PARM locf="",hostf="",type="ASCII"
setvar esc CHR(27) + "&oC"
setvar ftc "LOCF "+" !locf"
echo !esc!ftc
input cc
setvar ftc "HOSTF "+"!hostf"
echo !esc!ftc
input cc
setvar ftc "UPLOAD"
echo !esc!ftc
setvar hprog ""
input hprog
while hprog = "" do
input hprog
endwhile
!hprog
input cc
echo File transfer complete
```

COBOL Program Example

```
IDENTIFICATION DIVISION.
*
* Example HP3000 program to initiate a file
* transfer thru MS92.
*
   PROGRAM-ID. PCFT.
   AUTHOR. MINISOFT.
   DATE-WRITTEN. 09/03/91.
   ENVIRONMENT DIVISION.
   CONFIGURATION SECTION.
   SOURCE-COMPUTER. HP-3000.
   OBJECT-COMPUTER. HP-3000.
   DATA DIVISION.
   WORKING-STORAGE SECTION.
*
* Variables for requesting and receiving MS92's
* ID string.
*
   01 MS92-ID-REQ.
            05 FILLER  PIC X VALUE IS %33.
    05 FILLER          PIC X(8)
     VALUE IS "*s12347^".
    77 MS92-ID         PIC X(20).
*
* Escape sequence to start the file transfer.
*
   01 PCFT-CMD.
    05 FILLER          PIC X VALUE IS %33.
    05 FILLER          PIC XXX VALUE IS "&oC".
    05 CMD-LINE        PIC X(20).
*
* Variables to receive and parse the RUN
* statement received from the PC "filetran"
* program.
*
   77 RUN-STATEMENT    PIC X(44).
   77 DUMMY            PIC X(4).
   77 PROGRAM-NAME     PIC X(40).
   77 PARM-OPTION      PIC X(10).
   77 PARM-VALUE       PIC 999.
*
* DC1 character needed to end file transfer.
*
   77 DC1
PIC X VALUE IS %21.
*
* Variable to receive the device completion
* code.
*
```

```
   77 DEV-COMP-CODE     PIC X(5).
*
* Variables for CREATEPROCESS intrinsic.
*
* MPE-V.
* 77 CP-ERROR           PIC S9(4) COMP.
* 01 CP-ITEM-ARRAYS.
*        05 ITEMNUMS-C.
*           10 ITEMNUMS PIC S9(4) COMP OCCURS 3.
*        05 ITEMS-C.
*           10 ITEMS    PIC 9(4) COMP OCCURS 3.
*
* MPE/iX.
 77 CP-ERROR            PIC S9(9) COMP.
 01 CP-ITEM-ARRAYS.
  05 ITEMNUMS-C.
     10 ITEMNUMS        PIC S9(9) COMP OCCURS 3.
  05 ITEMS-C.
           10 ITEMS     PIC S9(9) COMP OCCURS 3.
*
* BOTH MPE-V AND MPE/iX.
*
 77 MS92LINK-PIN        PIC S9(4) COMP.
 77 SUSPEND
PIC 9(4) COMP.

PROCEDURE DIVISION

MAIN-PROCEDURE.
*
* Request, receive and check MS92 ID string.
*
   DISPLAY MS92-ID-REQ.
   MOVE SPACES TO MS92-ID.
   ACCEPT MS92-ID.
   IF MS92-ID IS NOT EQUAL TO "MS92 IS BETTER";
      THEN
       DISPLAY "THE TERMINAL EMULATOR IS NOT
        MS92"
        STOP RUN;
   ELSE NEXT SENTENCE.
*
* Issue file transfer commands.
*
   MOVE SPACES TO CMD-LINE.
   MOVE "LOCF PCFILE" TO CMD-LINE.
   DISPLAY PCFT-CMD.
   ACCEPT DEV-COMP-CODE.
*
   MOVE SPACES TO CMD-LINE.
   MOVE "HOSTF HOSTFILE" TO CMD-LINE.
   DISPLAY PCFT-CMD.
   ACCEPT DEV-COMP-CODE.
```

```
*
   MOVE SPACES TO CMD-LINE.
   MOVE "ASCII" TO CMD-LINE.
   DISPLAY PCFT-CMD.
   ACCEPT DEV-COMP-CODE.
*
   MOVE SPACES TO CMD-LINE.
   MOVE "UPLOAD" TO CMD-LINE.
   DISPLAY PCFT-CMD.
*
* Receive RUN statement and RUN the named
* program. (typically MS92LINK.PUB.SYS)
*
   MOVE SPACES TO RUN-STATEMENT.
   PERFORM GET-PROG-NAME
     UNTIL RUN-STATEMENT IS NOT EQUAL TO SPACES.
*
* Get the device completion code from MS92.
*
   ACCEPT DEV-COMP-CODE.
*
* End of program.
*
   STOP RUN.
*
* Receive the RUN statement from the PC and if
* it is not blank, RUN the named program.
*
   GET-PROG-NAME.
    MOVE SPACES TO RUN-STATEMENT.
    ACCEPT RUN-STATEMENT.
    IF RUN-STATEMENT IS NOT EQUAL TO SPACES;
       THEN PERFORM RUN-MS92LINK;
    ELSE NEXT SENTENCE.
*
* Parse the RUN statement received from the PC
* for the program name and any 'PARM='
* parameter. Then use the CREATEPROCESS and
* ACTIVATE intrinsics to RUN the named program.
*
   RUN-MS92LINK.
    MOVE SPACES TO PROGRAM-NAME, PARM-OPTION.
    MOVE ZEROS TO PARM-VALUE.
    UNSTRING RUN-STATEMENT
        DELIMITED BY ALL SPACE, OR ";"
        INTO DUMMY, PROGRAM-NAME, PARM-OPTION.
    IF PARM-OPTION IS NOT EQUAL TO SPACES; THEN
       UNSTRING PARM-OPTION
          DELIMITED BY ALL SPACE, OR "="
                INTO DUMMY, PARM-VALUE;
    ELSE NEXT SENTENCE.
    MOVE 2 TO ITEMNUMS(1).
    MOVE PARM-VALUE TO ITEMS(1).
```

```
   MOVE 3 TO ITEMNUMS(2).
   MOVE 1 TO ITEMS(2).
   MOVE 0 TO ITEMNUMS(3).
   MOVE 0 TO ITEMS(3).
   MOVE 2 TO SUSPEND.
   CALL INTRINSIC "CREATEPROCESS"
   USING CP-ERROR, MS92LINK-PIN,
@PROGRAM-NAME,
   ITEMNUMS-C, ITEMS-C.
   CALL INTRINSIC "ACTIVATE"
    USING \MS92LINK-PIN\, \SUSPEND\.
```

MS92LITE COMMAND LANGUAGE

The MS92LITE Command Language allows you to automate many repetitive and time consuming tasks. The Command Language addresses three general areas: dialing through a modem and logging in to a host, transferring files to and from the host, and redirecting the output of PC applications to host based printers.

MiniSoft's Command Language is a powerful and flexible tool, and it is easy to use. Every command can be executed by itself, or you can combine commands in a batch file to perform a series of tasks.

To use the commands type in the name of the command followed by the values for the parameters. Each parameter must be separated by a space.

The following conventions are used for describing the commands with their parameters. All commands are shown in upper case bolded letters. Each parameter is enclosed by a less than sign, "<", and a greater than

sign, ">", i.e. <parameter>. Parameters and symbols enclosed in brackets, "[" and "]", are optional. An ellipsis, "...", means you may repeat the parameters one or more times. All other characters or symbols should be entered as shown.

If you omit any optional parameters then the default values for those parameters will be used. Default values for the parameters are listed in the "Parameter values and meanings:" section.

Every time you execute a command it returns an exit code. The exit code is used by programs that call the commands (in the Command Language) to determine whether or not the command was successful in executing its function. An exit code of zero always indicates success. Other exit codes indicate a problem or error. Each section has its own set of exit codes and an explanation of what each exit code means.

Some of the commands in the MiniSoft 92 Command Language can read information files which replace a command string or a group of parameters. These information files are called specification files. You can create specification files with any ASCII editor. The specification files will vary with the different commands but the usage is always the same. Substitute the name of the specification file, preceded by an "@", for the string or the group of parameters.

Batch files are different from specification files. Batch files are special DOS files that have a file extension of ".BAT". Used in conjunction with the Command Language you can automate the execution of a series of commands.

While communicating with the host through the com port you will often find it necessary to enter control codes in either the prompt or the response string. The control codes and their meanings are listed below.

Control Codes

*@ Null	*P Data Link Escape
*A Start of Heading	*Q Device Control 1 or X-ON
*B Start of Text	*R Device Control 2
*C End of Text	*S Device Control 3 or X-OFF
*D End of Transmission	*T Device Control 4
*E Enquiry	*U Negative Acknowledge
*F Acknowledge	*V Synchronous Idle
*G Bell	*W End of Transmission Block
*H Backspace	*X Cancel
*I Horizontal Tabulation	*Y End of Medium
*J Line Feed	*Z Substitute
*K Vertical Tabulation	*[Escape
*L Form Feed	*\ File Separator
*M Carriage Return	*] Group Separator
*N Shift Out	*^ Record Separator
*O Shift In	*_ Unit Separator

Commands for automating dialing / login.

DIAL <port> <baud rate> <db/par> "[{]<prompt>|<response>[}]..." [<timeout> <retry>]

LOGIN <port> <baud rate> <db/par> "[}]<prompt>|<response>[}]..." [<timeout> <retry>]

LOGOUT <port> <baud rate> <db/par> "[{]<prompt>|<response>[}]..." [<timeout> <retry>]

HOSTCMD <port> <baud rate> <db/par> "[{]<prompt>|<response>[}]..." [<timeout> <retry>]

or

DIAL <port> <baud rate> <db/par> @<file> [<timeout> <retry>]

LOGIN <port> <baud rate> <db/par> @<file> [<timeout> <retry>]

LOGOUT <port> <baud rate> <db/par> @<file> [<timeout> <retry>]

HOSTCMD <port> <baud rate> <db/par> @<file> [<timeout> <retry>]

Note: @<file> indicates a specification file

Parameter values and meanings:

<port>	1	= com1	<db/par>	0 = 8/none
	2	= com2		1 = 7/0's
	3	= com3		2 = 7/1's
	4	= com4		3 = 7/odd
	3V	= com3-vectra		4 = 7/even
	4V	= com4-vectra		
	N(<node>)	= novell/npc		
	A(<node>)	= advancenet		
	I<port>	= interrupt 14 <port> =1,2,3,4		
	H6(<node>)	= harris 9600		
	H3(<node>)	= harris 9300		

<baud rate> 300
1200
2400
4800
9600
19200

prompt/response: any ASCII character

Note: asterisk (*) preceding a char indicates a control character.

i.e. *M = RETURN
** = *
*! = BREAK

Option <timeout> in seconds. The default is 20 seconds.

Option <retry> # of times to retry prompt/response enclosed in parentheses ( ). The default is 10 retries.

@file specification file with prompt/response string.

Parameter descriptions:

<port>	the com port through which you are connected to the host.
<baud rate>	the speed at which you are communicating with the host.
<db/par>	the data bits and parity which are set for the com port.
<prompt>	contains the command script you are sending to the port.
<response>	contains the command script of the expected response from the port.
<timeout>	the length of time to wait for a response from the port.
<retry>	the number of times to send the prompt.
<file>	the name of the specification file with prompt/response strings.

Command descriptions:

These commands allow you to automate dialing through a modem, the login and logout procedures to the host, and the commands on the host once you have logged in.

There are two ways to use these commands. You may enter the prompt and response strings directly on the command line or you may reference a specification file which contains the prompt and response strings. The first option is ideal for short commands since you are limited to 127 total characters per command line. The second option should be used for longer commands. Both options are shown on the following pages.

Examples

Example 1:

Prompt/response pairs in the command line

```
LOGIN     <port> <baud rate> <db/par> "[(]<prompt>|<response>[)]..."
          [<timeout> <retry>]

LOGIN     1 9600 0 "(*M|:*Q)|HELLO MGR.MINISOFT *M|
          PASSWORD:*Q|SUPER*M|:*Q"
```

All four commands DIAL, LOGIN, LOGOUT, and HOSTCMD have the same parameters. If you enter the string in the command line, then the first three parameters are required. The prompt and response pairs must be enclosed by double quotes. You may only retry one prompt and response pair at a time. However, you may have several prompt and response pairs within the double quotes, see the example above. The bar separator, "|", must be placed between each prompt and response. The timeout and retry parameters are optional.

You do not need to type the command name in uppercase characters. However, the characters in the prompt/response string must match the input and output of the host exactly.

The control characters, the characters preceded by an '*', can be either upper or lower case.

Note: When you are sending prompts to the host it is very important to place a return, "*M", after a command when they are required. Failure to do this will cause the command script to halt.

Example 2:

Prompt/response pairs in the specification file

LOGIN <port> <baud rate> <db/par> @<file> [<timeout> <retry>]

LOGIN 1 9600 0 @login.sp
where the contents of the specification file "login.spe" is:
*MI:*Q|HELLO MGR.MINISOFT*M|PASSWORD: Q|SUPER*M|:*Q

The parameters are set up the same way as in the example, except that the prompt and response pairs are in a specification file called login.spe.

Note: In the command line, the specification file name must be preceded by the "@" character.

Example 3:

Text of a batch file using the DIAL and LOGIN commands

```
echo off
rem Example dial phone#, logs in, runs MS92 terminal emulator,
rem then logs off
rem parameters are port, baud rate, and data bits/parity
dial 1 1200 0 "(atdt15551212*M|CONNECT 1200)" 40 5
if errorlevel 1 goto end
login 1 1200 0 "*M|:*Q|HELLO MGR.MINISOFT*M|
PASSWORD:*Q|SUPER*M|:*Q"
if errorlevel 1 goto end
ms92
logout 1 1200 0 "*M|:*Q|BYE*M|*M*J"
:end
```

You can also use replaceable parameters within the batch file. Using the batch file below, you would type in BATCH-FILENAME 1 1200 0 to duplicate the batch file above.

```
echo off
rem Example dial phone#, logs in, runs MS92 terminal emulator,
rem then logs off
rem parameters are port, baud rate, and data bits/parity
dial %1 %2 %3 "(atdt15551212*M|CONNECT 1200)" 40 5
if errorlevel 1 goto end
login %1 %2 %3 "*M|:*Q|HELLO MGR.MINISOFT*M|
PASSWORD:*Q|SUPER*M|:*Q"
if errorlevel 1 goto end
ms92
logout %1 %2 %3 "*M|:*Q|BYE*M|*M*J"
:end
```

Dial, Login, Logoff, Hostcmd Exit Codes:

0	successful
1	opening com port
2	closing com port
3	writing to com port
9	time out error
10	port invalid
11	no port parameter
12	baud rate invalid
13	no baud rate parameter
14	data bits/parity invalid
15	no data bits/parity parameter
18	time out invalid
19	retry invalid
20	language dependent text invalid
30	syntax error in string
31	right parenthesis for retry not found
32	one prompt/response pair in retryb

40 opening specification file
41 unable to locate specification file
42 reading a character from specification file
43 retry string not found in specification file
44 retry string in specification file is too long
45 reading an escape character from specification file

Commands for automating file transfer

FILETRAN <port> <baud rate> <db/par> <dir> <locfile> <hostfile>
[<file type> <rec size> <save file info.>]

or

FILETRAN <port> <baud rate> <db/par> @<file>

Note: @ <file> indicates a specification file

Parameter values and meanings:

<port>	1	= com1	<db/par>	- 0 = 8/none
	2	= com2		- 1 = 7/0's
	3	= com3		- 2 = 7/1's
	4	= com4		- 3 = 7/odd
	3V	= com3-vectra		- 4 = 7/even
	4V	= com4-vectra		
	N(<node>)	= novell/npc		
	A(<node>)	= advancenet		
	I<port>	= interrupt 14 <port> = 1,2,3,4		
	H6(<node>)	= harris 9600		
	H3(<node>)	= harris 9300		

<baud rate> 300
1200
2400
4800
9600
19200

<dir> 0 to host
1 from host

<locfile> local file name
<hostfile> host file name

option <file type> A ASCII - default
B Binary

option <rec size> - record size
default 80 for ASCII files
256 for Binary files

option <save file info > Y = yes (Binary only)
N = no

@<file> the name of a specification file which contains a list of files to be transferred, one file per line.

Each line should have the following format:
<dir> <locfile> <hostfile> [<file type> <rec size> <save info.>]

FILELIST <dir> <filetype> <rec size> <sav file info> <local file mask> [<local file mask>]

Parameter values and meanings:

<local file mask> look for the local files specified by this parameter; wildcard characters are valid.

For example:

filelist 0 A 80 N c:*.DOC c:*.EXE

Parameter descriptions:

<port>	the com port through which you are connected to the host
<baud rate>	the speed at which you are communicating with the host
<db/par>	the data bits and parity which are set for the com port
<dir>	the direction of the file transfer
<locfile>	the local file name
<hostfile>	the host file name

<file type>	the type of file to be transferred
<rec size>	record size
<save file info.>	save the file information for binary files (from host only)
<file>	the name of the specification file
with	
	a list of file names
<local file mask>	a local file or group of local files when using wildcard characters

Command descriptions:

The FILETRAN command lets you automate file transfers to and from the host. Used together with the FILELIST command, you can upload several files by typing in just one command.

The FILELIST command lets you generate a list of files and put that list into a specification file.

There are two ways to use FILETRAN. You may enter all the parameters in a single command line, or you may use a specification file to list the names of all the files to transfer. The file names in the specification file must be on separate lines.

To stop a batch file transfer, press the CTRL key along with the BREAK key. This will terminate the file transfer.

Examples:

Example 1:

Files listed in the command line

```
FILETRAN   <port> <baud rate> <db/par> <dir> <locfile> <hostfile>
           [<file type> <rec size> <save file info.>]
FILETRAN   1 9600 0 0 c:\reports\inven.rep inven.reports.minisoft
```

The first six parameters are required. Make sure that the direction is correct and verify the syntax for the local and host file names. Use the optional parameters as necessary.

Example 2:

Files listed in a specification file

```
FILETRAN   <port> <baud rate> <db/par> @<file>
FILETRAN   1 1200 0 @files
```

where the content of the specification file looks like:

```
0 update.txt update.txt.minisoft A 80 N
0 info.txt info.txt.minisoft A 80 N
```

All parameters are necessary. Verify that the specification file has the proper format. See the description above.

Example 3:

Files listed in the command line saved in an output file

```
FILELIST   <dir> <file type> <rec size> <save file info.> <local file mask>
FILELIST   0 B 256 *.obj > binfiles
```

Example 4:

A batch file with the FILELIST command

```
echo off
rem Creates a list of exe files to transfer
```

filelist 0 B 256 Y *.exe >files
here the output file "files" looks like:

```
0 PROGRAM.EXE WP.EXE B 256 Y
0 FTRANS.EXE FTRANS.EXE B 256 Y
0 REDIRECT.EXE REDIRECT.EXE B 256 Y
0 FILETRAN.EXE FILETRAN.EXE B 256 Y
0 DIAL.EXE DIAL.EXE B 256 Y
0 LOGIN.EXE LOGIN.EXE B 256 Y
0 LOGOUT.EXE LOGOUT.EXE B 256 Y
0 HOSTCMD.EXE HOSTCMD.EXE B 256 Y
0 FILELIST.EXE FILELIST.EXE B 256 Y
```

All parameters for FILELIST are required. Wildcard characters are valid in the local file mask parameter. Do not forget to redirect the output to your file name, otherwise the output will go to the screen.

Example 5:
Downloading of a specific file to the PC

```
LOGIN 1 9600 0 "(*M|:*Q)|HELLO GROUP.ACCOUNT
*M|PASSWORD:*Q|ANYPW*M|:*Q"
FILETRAN 1 9600 0 1 C:\DIRECTORY\LOCALFILE
HOSTFILE.GROUP.ACCOUNT
HOSTCMD 1 9600 0 "(*M|:*Q)|PURGE
HOSTFILE.GROUP.ACCOUNT*M|:*Q"
LOGOUT 1 9600 0 "(*M|:*Q)|BYE*M|*M*J"
```

This command script will logon to the HP3000 and download a specific file to the PC then purge the host file and logoff the host.

Example 6:
Transfer an ASCII file to an HP9000 host

```
LOGIN 1 9600 0 "*M|login:"
LOGIN 1 9600 0 "minisoft*M|TERM = *(98700*)"
LOGIN 1 9600 0 "hp2392*M|$"
```

```
FILETRAN 1 9600 0 0 file.tmp tmp/fil
LOGOUT 1 9600 0 "exit*Ml"
```

Filetran exit codes

0	successful
1	error opening local file
2	error closing local file
3	error reading local file
4	error writing local file
5	error opening host file
6	error closing host file
7	error reading host file
8	error writing host file
14	unable to connect to host
21	port invalid
22	baud rate invalid
23	db/parity invalid
24	direction invalid
25	file type invalid
26	rec size invalid
27	save file info invalid
28	file names not supplied
29	specification file does not exist
30	error in specification file
31	transfer stopped by user (CTRL & BREAK keys)

Host Initiated File Transfer

A host program can initiate a file transfer by instructing MS92LITE to issue the Host Initiated Command escape sequence (esc&oC <command>cr) where <command> is a 'filetran' command. When issuing a 'filetran' command in this manner the datacomm parameters should be designated with dashes ('-') instead of actual values.

Here is an example of an escape sequence to start a file transfer from a host program.

esc&oCfiletran - - - 0 pcfile hostfile A 80cr

After this escape sequence is sent to MS92LITE, the host program reads the RUN statement issued by the 'filetran' PC program. When the host program receives the RUN statement, it uses the CREATEPROCESS and ACTIVATE intrinsics to RUN the named program (typically MS92LINK.PUB.SYS). When the named program has terminated, the host program sends a DC1 (binary value 17) to the PC to terminate the file transfer. Then the host program reads the device completion code from MS92LITE. This will be one character indicating the command has executed.

Here is an example of a COBOL program which demonstrates a host initiated file transfer. This example was written for the COBOLII compiler on MPE-V or the COBOL74 compiler on MPE/iX. Use the designated statement for MPE-V or MPE/iX and comment out the others. Be sure to PREP or LINK your host program with PH capability, which is required to use the CREATEPROCESS and ACTIVATE intrinsics.

```
IDENTIFICATION DIVISION.
*
* Sample HP3000 program to initiate a file
* transfer thru MS92.
*
  PROGRAM-ID. PCFT.
  AUTHOR. MINISOFT.
  DATE-WRITTEN. 09/03/91.
  ENVIRONMENT DIVISION.
  CONFIGURATION SECTION.
  SOURCE-COMPUTER. HP-3000.
  OBJECT-COMPUTER. HP-3000.
DATA DIVISION.

WORKING-STORAGE SECTION.
*
```

```
* Variables for requesting and receiving MS92's
* ID string.
*
  01 MS92-ID-REQ.
   05 FILLER        PIC X VALUE IS %3.
   05 FILLER        PIC X(8).
    VALUE IS "*s12347^".
  77 MS92-ID        PIC X(20).
*
* Escape sequence to start the file transfer.
*
  01 PCFT-CMD.
   05 FILLER        PIC X VALUE IS %33.
   05 FILLER        PIC XXX VALUE IS "&oC".
   05 FT-COMMAND    PIC X(37) VALUE IS
    "FILETRAN - - - 0 PCFILE HOSTFILE A 80".
   05 FILLER        PIC X VALUE IS %15.
*
* Variables to receive and parse the RUN
* statement received from the PC 'filetran'
* program.
*
  77 RUN-STATEMENT PIC X(44).
  77 DUMMY         PIC X(4).
  77 PROGRAM-NAME  PIC X(40).
  77 PARM-OPTION   PIC X(10).
  77 PARM-VALUE    PIC 999.
*
* DC1 character needed to end file transfer.
*
  77 DC1           PIC X VALUE IS %21.
*
* Variable to receive the device completion
* code.
*
  77 DEV-COMP-CODE PIC X(5).
*
* Variables for the CREATEPROCESS and ACTIVATE
* intrinsics.
*
* MPE-V.
  77 CP-ERROR      PIC S9(4) COMP.
  01 CP-ITEM-ARRAYS.
   05 ITEMNUMS-C.
    10 ITEMNUMS    PIC S9(4) COMP OCCURS 3.

   05 ITEMS-C.
    10 ITEMS       PIC 9(4) COMP OCCURS 3.
*
* MPE/iX.
  77 CP-ERROR      PIC S9(9) COMP.
  01 CP-ITEM-ARRAYS.
   05 ITEMNUMS-C.
```

```
    10 ITEMNUMS    PIC S9(9) COMP OCCURS 3.
   05 ITEMS-C.
    10 ITEMS       PIC S9(9) COMP OCCURS 3.
*
* BOTH MPE-V AND MPE/iX
*
  77 MS92LINK-PIN  PIC S9(4) COMP.
  77 SUSPEND       PIC 9(4) COMP.

PROCEDURE DIVISION.
MAIN-PROCEDURE.
*
* Request, receive and check MS92 ID string.
*
  DISPLAY MS92-ID-REQ.
  MOVE SPACES TO MS92-ID.
  ACCEPT MS92-ID.
  IF MS92-ID IS NOT EQUAL TO "MS92 IS BETTER";
     THEN
      DISPLAY "THE TERMINAL EMULATOR IS NOT
      MS92"
     STOP RUN;
  ELSE NEXT SENTENCE.
*
* Issue file transfer command.
*
  DISPLAY PCFT-CMD.
*
* Receive RUN statement and RUN the named
* program. (typically MS92LINK.PUB.SYS)
*
  MOVE SPACES TO RUN-STATEMENT.
  PERFORM GET-PROG-NAME
    UNTIL RUN-STATEMENT IS NOT EQUAL TO SPACES.
*
* Send DC1 to the PC to end the file transfer.
*
  DISPLAY DC1.
*
* Get the device completion code from MS92.
*
  ACCEPT DEV-COMP-CODE.
*
* End of program.
*
  STOP RUN.
*
* Receive the RUN statement from the PC and if
* it is not blank, RUN the named program.
*
 GET-PROG-NAME.
  MOVE SPACES TO RUN-STATEMENT.
  ACCEPT RUN-STATEMENT.
```

```
  IF RUN-STATEMENT IS NOT EQUAL TO SPACES;
     THEN PERFORM RUN-MS92LINK;
  ELSE NEXT SENTENCE.
*
* Parse the RUN statement received from the PC
* for the program name and any 'PARM='
* parameter. Then use the CREATEPROCESS and
* ACTIVATE intrinsics to RUN the named program.
*
 RUN-MS92LINK.
  MOVE SPACES TO PROGRAM-NAME, PARM-OPTION.
  MOVE ZEROES TO PARM-VALUE.
  UNSTRING RUN-STATEMENT
   DELIMITED BY ALL SPACE, OR ";"
   INTO DUMMY, PROGRAM-NAME, PARM-OPTION.
  IF PARM-OPTION IS NOT EQUAL TO SPACES; THEN
  UNSTRING PARM-OPTION
   DELIMITED BY ALL SPACE, OR "="
   INTO DUMMY, PARM-VALUE;
  ELSE NEXT SENTENCE.
  MOVE 2 TO ITEMNUMS(1).
  MOVE PARM-VALUE TO ITEMS(1).
  MOVE 3 TO ITEMNUMS(2).
  MOVE 1 TO ITEMS(2).
  MOVE 0 TO ITEMNUMS(3).
  MOVE 0 TO ITEMS(3).
  MOVE 2 TO SUSPEND.
  CALL INTRINSIC "CREATEPROCESS"
   USING CP-ERROR, MS92LINK-PIN,
 @PROGRAM-NAME,
  ITEMNUMS-C, ITEMS-C.
  CALL INTRINSIC "ACTIVATE"
   USING \MS92LINK-PIN\, \SUSPEND\.
```

Commands for automating redirected print

REDIRECT <port> <baud rate> <db/parity> <program> <loc printer> <host printer> [<timeout>]

Parameter values and meanings:

<port>	1	= com1	<db/par> 0 = 8/none
	2	= com2	1 = 7/0's
	3	= com3	2 = 7/1's
	4	= com4	3 = 7/odd
	3V	= com3-vectra	4 = 7/even
	4V	= com4-vectra	
	N(<node>)	= novell/npc	
	A(<node>)	= advancenet	
	I<port>	= interrupt 14 <port> = 1,2,3,4	
	H6(<node>)	= harris 9600	
	H3(<node>)	= harris 9300	

<baud rate> 300
1200
2400
4800
9600
19200

<program> program to run

<local printer> LPT1, LPT2, LPT3

<host printer> host printer

<timeout> 0 = 15 seconds
1 = 30 seconds
2 = 45 seconds
3 = 60 seconds
4 = None (default)

Parameter descriptions:

<port>	the com port through which you are connected to the host
<baud rate>	the speed at which you are communicating with the host
<db/par>	the data bits and parity which are set for the com port
<program>	the program whose output will be redirected to the host
<loc printer>	the device to which the local printer is attached
<host printer>	the host printer's LU or device class
<timeout>	the amount of time to wait for a response from the port

Command descriptions:

The REDIRECT command allows you to direct output from your PC packages to host-based printers. You should use the Command Language (REDIRECT.EXE) with PC packages that require a lot of memory. If you use the redirect option from within the MiniSoft 92 Terminal Emulator (MS92LITE.EXE) you limit the size of the PC applications you can successfully redirect.

Used in conjunction with batch files and other Command Language commands you can set up many different types of redirection.

Examples:

Example 1:

Specifying a ".EXE" or ".COM" program

```
REDIRECT    <port> <baud rate> <db/par> <program> <loc printer>
            <host printer> [<timeout>]
REDIRECT    1 9600 0 C:\MINISOFT\MINIWORD.EXE lpt1 lp/s 0
```

The first five parameters are required. The program parameter must specify the full path to the program or the program must be in a directory included in the PATH statement. Only ".EXE" and ".COM" programs can be run in this manner.

Example 2:

Specifying a batch file or DOS command in the program parameter

```
REDIRECT    <port> <baud rate> <db/par> <program> <loc printer>
            <host printer> [<timeout>]
REDIRECT    1 9600 0 "command.com /c dir *.* > lpt1" lpt1 lp 0
```

When you specify a batch file or a DOS command in the program parameter you must run a copy of command.com with the /c option. Command.com must be specified in the PATH or it must be in your directory. If you are running a batch program the batch extension must be left off, i.e. "command.com /c wp > lpt1" where WP. BAT is your batch file.

Example 3:

REDIRECT used inside of a batch file

```
echo off
rem Example dial phone#, logs in, turns printer redirection on,
rem runs a second copy of dos to print out a dir listing,
rem turns printer redirection off, then logs off
rem parameters are port, baud rate, and data bits/parity
```

```
dial %1 %2 %3 "(atdt15551212*M|CONNECT 1200)" 40 5
if errorlevel 1 goto end
login %1 %2 %3 "*M|:*Q|HELLO  MGR.MINISOFT*M|
PASSWORD:*Q|SUPER*M|:*Q"
if errorlevel 1 goto end
redirect %1 %2 %3 "command.com /c dir *.* >lpt1" lpt1 lp
logout %1 %2 %3 "*M|:*Q|BYE*M|*M*J"
:end
```

Redirect exit codes:

1	unable to connect
2	redirect printer name invalid
21	port invalid
22	baud rate invalid
23	db/parity invalid
24	program name missing
25	time out invalid
26	redirection printer names missing

Specific redirect batch file examples:

The following examples are batch files that reside on the PC. The first three examples redirect the output of a PC application to an HP3000 host. The fourth example demonstrates how to redirect PC word processing output to a HP9000 host printer. You may have to alter these examples slightly for your computer system.

These examples use COM2 at 19,200 baud with 8 bits and no parity. The printer is a LaserJet, serially connected to the host on device 40 (the /s indicates a serial connection). The account REDIRECT was created on the HP3000.

The LOGIN command includes the password, PRINT, for this example of the REDIRECT account on the HP3000.

WordPerfect

```
LOGIN 2 19200 0 "*M!:*Q!HELLO MGR.REDIRECT/PRINT*M!:*Q"
REDIRECT 2 19200 0 C:\WP50\WP.EXE LPT1 40/S 0
LOGOUT 2 19200 0 "*M!:*Q!BYE*M!*M*J"
```

Microsoft Word

```
LOGIN 2 19200 0 "*M!:*Q!HELLO MGR.REDIRECT/PRINT*M!:*Q"
REDIRECT 2 19200 0 C:\WORD\WORD.EXE LPT1 40/S 0
LOGOUT 2 19200 0 "*M!:*Q!BYE*M!*M*J"
```

Lotus 1-2-3

```
LOGIN 19200 0 "*M!:*Q!HELLO MGR.REDIRECT/PRINT*M!:*Q"
REDIRECT 2 19200 0 C:\LOTUS\123.EXE LPT1 40/S 0
LOGOUT 2 19200 0 "*M!:*Q!BYE*M!*M*J"
```

WordPerfect redirected to a HP9000 printer

```
LOGIN 2 9600 0 "*M!login:"
LOGIN 2 9600 0 "minisoft*M!TERM = *(98700*)"
LOGIN 2 9600 0 "hp2392*M!$"
REDIRECT 2 9600 0 "C:\WP50\WP.EXE" LPT1 "| lp -s"
LOGOUT 2 9600 0 "exit*M!"
```

The WAIT command

WAIT <time>

Parameter values and meanings:
<time> - time is in military format, i.e. 1630 = 4:30 pm.

Parameter descriptions:
<time> - the time at which the WAIT command stops waiting.

Command description:
The WAIT command allows you to wait until a specified time to perform an action. The WAIT command is

an ideal way to delay an automated file transfer until the phone rates drop.

To break out of the WAIT command press the CTRL key and the BREAK key together.

Example:

Example 1:
WAIT command in a batch file

```
echo off
rem Example Waits for 8:00pm (2000), dials phone#,
rem logs in, transfers a file to the pc,
rem then logs off
rem parameters are port, baud rate, and data bits/parity
wait 2000
if errorlevel 1 goto end
dial %1 %2 %3 "(atdt15551212*M|CONNECT 1200)" 40 5
if errorlevel 1 goto end
login %1 %2 %3 "*M|:*Q|HELLO
MGR.MINISOFT*M|PASSWORD:*Q|SUPER*M|:*Q"
if errorlevel 1 goto end
filetran %1 %2 %3 1 c:\reports\inven.rep inven.reports.minisoft A
logout %1 %2 %3 "*M|:*Q|BYE*M|*M*J"
:end
```

APPENDIX C

TROUBLESHOOTING

This appendix lists error messages associated with various situations you may encounter while running MiniSoft 92. These situations are as follows:

- Losing a connection
- Running in debug mode (LANs)
- Running the command language
- Configuring settings
- Transferring files

Losing a Connection

Sometimes, a network problem will cause your PC to be disconnected from the host. If this happens, you will see the message:

```
Off line. (R)etry, (C)onfigure (Q)uit.
```

Press **R** and MiniSoft 92 will attempt to reconnect to the same host. Press **C** to configure a connection for a different host.

Running in Debug Mode

MiniSoft 92 can be run in DEBUG mode by typing `MS92 D`. All messages and communication occurring between the PC and host are displayed to the screen as MiniSoft 92 attempts to make a LAN connection.

Common Debug Messages on the LAN

Cannot receive IP packets: **1.** Occurs when using the Clarkson Packet Drivers and the Frame Type is configured incorrectly. Choose another Frame Type. **2.** ODI users operating with ODIPKT will want to check their NET.CFG for the order of each frame statement. If you are selecting 802.3 as your Frame Type in the Network Configuration screen, make sure Frame Ethernet_802.2 is in your NET.CFG. Load ODIPKT based on the position of the 802.2 frame statement. If it is positioned after 802.3, load ODIPKT with the number 1 (ODIPKT 1). If 802.2 is after frame statements Ethernet II and Ethernet 802.3, load ODIPKT with the number 2 (ODIPKT 2).

Check net.cfg: no logboard for frame type: **1.** The selected Frame Type is incorrect. This error message is usually followed by the error message, "Could not register stack with ODI." Change the Frame Type and press **R** to connect. **2.** Check to make sure that the NET.CFG is formatted correctly. Make sure that statements under each section heading are indented. Be sure that all statements are spelled correctly. **3.** This error can also mean that the right frame types are not listed in the NET.CFG. In most cases it is a

good idea to have all three of the following frame statements in NET.CFG:

- Frame Ethernet_802.3
- Frame Ethernet_802.2
- Frame Ethernet_II

Remember to lead with the frame statement that corresponds with the frame type your Novell LAN is operating under. **4.** The LAN card driver is attempting to read a NET.CFG from some other directory. Remember, LSL and the LAN card driver look for NET.CFG in the directory from which they are loading. If NET.CFG is not found, then LSL looks to the root directory.

Connection failed: **1.** Indicates the use of an incorrect Host Name or Host IP Address. If you are using HP Probe, make sure that you have keyed in the domain and organization names correctly. **2.** Duplicate Local IP Addresses can also cause this error. **3.** Check to see if the correct Lan Type has been chosen. **4.** Check the HP Probe field. Select **YES** if the Frame Type is 802.3 or **NO** if the Frame Type is Ethernet_II.

Connection lost: This error is often accompanied by a TCP/IP 507 error and indicates the host terminated or refused to grant the session. **1.** You will receive this error when you connect through the LAN but don't formally logon to the Host computer. Just select **R** for retry and your LAN connection should be re-established. **2.** The Host IP Address might be a valid IP Address but may not be the correct Host IP Address. An invalid IP Address would produce the

error "Host does not respond to arp" (Ethernet II) or "Unknown host name" (IEEE 802.3). **3.** Check to see if the host software is operating correctly. Network Services may not be started Start the LAN network with the commands:

```
:netcontrol start;net=LAN1
:netcontrol start;net=LOOP
:nscontrol start
```

Could not attach: This error indicates that the TCP/IP stack has not been loaded. If you are using LAN Workplace for DOS, make sure TCPIP.EXE has been executed.

Coul not register stack with ODI: **1.** Check the LAN Type that has been selected. For example if you are using odipkt.com and choose ODI as your LAN Type you will receive this error message. Select Packet Driver instead. **2.** Selecting an incorrect Frame Type will also give you this error when ODI is the LAN Type. Your NET.CFG may be missing a frame statement or there is a misspelling.

Host not responding to arp request: **1.** Check your Host IP Address. The wrong Host IP Address can cause this error. **2.** Check for wrong Frame Type. Change your Frame Type to IEEE 802.3 and select **YES** in the HP Probe field. **3.** Make sure your host LAN software is running.

Invalid Host ip address: Check the format of your Host IP Address (xxx.x.x.x). There cannot be any blank spaces between any of the numbers.

IP packet address not found: Indicates an incorrect local or Host IP Address. Insure that the right local

and Host IP Addresses are configured for in the Network Configuration screen.

NDIS absent or not bound (run NETBIND): MiniSoft 92 is not able to connect to NDIS. Possible reasons:

- Incorrect config.sys
- Incorrect PROTOCOL.INI
- NETBIND has not been run.

NDIS92.SYS driver not found: Make sure NDIS92.SYS exists and resides in the root or fully qualified directory of your PC. Check your config.sys to be sure that NDIS92.SYS is loaded with a **DEVICE=** statement.

No matching port found: Occurs when NACS is not running on the server that you are logging into.

No response from gateway: Incorrect or missing Gateway IP Address.

ODI92.SYS driver not found: Make sure ODI92.SYS exists and resides in the root or fully qualified directory of your PC. Check your config.sys to be sure that ODI92.SYS is loaded with a **DEVICE=** statement.

PACK92.SYS driver not found: Make sure PACK92.SYS exists and resides in the root or fully qualified directory of your PC. Check your config.sys to be sure that PACK92.SYS is loaded with a **DEVICE=** statement.

Packet driver not found: If you are using a Clarkson Packet Driver to establish your LAN connection this error indicates: **1.** Your packet driver is not loaded with the correct parameters. **2.** The packet driver

being loaded is not compatible with your PC LAN card. **3.** If you are configured for Clarkson as your LAN Type and are running ODI, make sure ODIPKT.COM is loaded.

TCPIP 405: **1.** Check for duplicate local IP addresses. **2.** This error occurs when Xon/Xoff handshaking is not enabled for receive and transmit pace at the PC for connections to HP3000/900 series host computers. Go to the Datacomm Configuration screen and turn these functions on. **3.** Under Windows, if screen saver is on you will receive this error when the screen saver activates.

TCPIP 507: Check to see that the LAN connection selected is correct. For example, selecting **ODI: Telnet** when connecting to an HP3000 running Network Services would cause this error.

Unknown host name: **1.** Check to make sure you have entered the correct Host name, Domain, and Organization names in their respective fields. All three names are *required.* **2.** Check for the wrong frame type. Change your frame type to Ethernet_II and select **NO** in the HP Probe field. and press **R** to retry and you should achieve a LAN connection.

Running the command language

While MiniSoft 92 is carrying out commands from a script file, it will report error messages regarding any problems it encounters:

Invalid Script Line: **1.** This error occurs when you execute a command that is not valid. Check your

syntax. **2.** Make sure that the last line of your script contains the END command. This command is designed to terminate the script.

Configuring MiniSoft 92

When you activate settings in the Datacomm Configuration or Special Configurations screen, you may receive an error message if you define an invalid setting.

Datacomm Configuration errors

Invalid Parameter (R)etry (C)onfigure (Q)uit: This message will display when you configure for a com port that does not exist. Press **C** to get back to the Datacomm Configuration screen and specify a valid com port.

Special Configuration errors

Invalid Row and Column Settings: Indicates a row and column selection that is not compatible with the video card in your PC. For example selecting 27 line display on an EGA based PC would cause this error message to be displayed.

Transferring Files

When transferring files, MiniSoft 92 may report one of several errors if there is a problem transferring the file. Some error messages specifically address uploading of the host program.

File Transfer Errors

Could not talk to host program Could not open host file: **1.** Indicates that the MiniSoft 92 program on the PC cannot locate MS92LINK, MS92LNK2, MS92LNK3 or MS92LNK4 on the host system. Check to see if one of these files is located in the GROUP and ACCOUNT specified in the "Host Program Name" field located in the Host Configuration screen. **2.** This error can indicate that you are not logged on to your host computer system. Be sure you have logged on before performing a file transfer. **3.** The host program(s) may have been corrupted during the upload procedure. Confirm that the uploading of the host program(s) was done with parity set to NONE/8. Any other parity settings during a host program upload will result in corrupted host program(s). Upload the host program again with the correct parity. **4.** Make sure you have configured the Expand Control Characters field correctly. Running MS92LINK with this field set to No would return this error. Set the field to Yes when running MS92LINK and MS92LNK3. Set the field to No when running MS92LNK2 and MS92LNK4. **5.** Make sure you are configured for the right default block size. Runing MS92LINK configured for a 1K block size would return this error. Change this field to a 128K block size.

Upload Host Program errors

Error Writing Host File: **1.** This error signals that you may not be logged on to your host computer system. Be sure you have logged on before attempting to

upload the host program. **2.** The term type (terminal type) is not 10. Logon "HELLO USER.ACCOUNT; TERM=10" to force the term type. **3.** Indicates that there may be a conflicting FCOPY UDC set on the host computer system. Remove the FCOPY UDC and upload the host program again. **4.** Attempting to upload the host program through an X.25 network or data switch can cause this error to occur. If possible upload the host computer through a direct serial or LAN connection. **5.** The error writing to the host file can also be caused by the baud rate being too fast. Set the baud rate to 2400 and try to upload the host program again.

File MS92LINK.MPE Not Found: The file MS92LINK.MPE does not exist on the PC or Mini-Soft 92 cannot find it to upload.

File MS92LNK2.MPE Not Found: The file MS92LNK2.MPE does not exist on the PC or Mini-Soft 92 cannot find it to upload.

File MS92LNK3.MPE Not Found: The file MS92LNK3.MPE does not exist on the PC or Mini-Soft 92 cannot find it to upload.

File MS92LNK4.MPE Not Found: The file MS92LNK4.MPE does not exist on the PC or Mini-Soft 92 cannot find it to upload.

GLOSSARY OF TERMS

Some of the networking and data processing terms in this documentation may not be familiar to some users. To help we have provided descriptions of some of the most common networking and data processing terms below.

802.3

IEEE protocol covering the data link layer. (The international standard is known as 802.3.) While 802.3 is physically compatible with standard Ethernet (It can operate concurrently with standard Ethernet over the same cable), 802.3 uses a slightly different form of packet header, so not every computer using Ethernet hardware can support both standard Ethernet and 802.3.

access method

The way in which a device on a LAN achieves access to the LAN to transmit data. Examples include token-passing and CSMA/CD.

ACK

(acknowledgment) A response sent by a receiver to indicate successful reception of information. Acknowledgments can be implemented at any level including the physical level (using voltage on one or more wires to coordinate transfer), the link level (to indicate successful transmission across a single hardware link), or higher levels (for example, to allow an application program at the final destination to respond to an application program at the source).

address

A numerical identifier to distinguish one node from another.

address mask

A technique used to select bits from an Internet address for subnet addressing.

address resolution

The conversion of an Internet address into a physical address. May require broadcasting on a local network.

ALT

Alternate. A key that, when pressed, signals the computer of a change in the meanings of other keys struck in conjunction with it.

ANSI

(American National Standards Institute) A group that defines U.S. standards for the information processing industry.

API

(Application Program Interface) A software interface used for communications between a

programming language and an application to give transparent access to the application's services, such as those for network devices, files, or interprocess communications.

application layer
The highest layer in the OSI model. It usually performs user services, such as file transfer.

architecture
The hardware and software arrangement that determines how the various network components work together.

ARP
(Address Resolution Protocol) A TCP/IP protocol process that maps IP addresses to Ethernet addresses. Required by TCP/IP for use with Ethernet.

ARPANET
A packet-switching network developed by the Defense Advanced Research Projects Agency. (DARPA), linking computer systems in universities and federal agencies. TCP/IP was part of its development. ARPANET has since been absorbed by Internet.

ARPA Services
The services used by ARPANET that are part of the Internet protocol suite, including FTP, SMTP, Telnet, and several other protocols.

ASCII
(American Standard Code for Information Interchange) The most common coding system for

converting letters, numerals, and other symbols into a form usable by computers and peripherals.

ASCII file transfer
A seven-bit transfer of text files that are presented in ASCII form.

asynchronous transmission
A data transmission method in which each character is a complete unit containing its own start and stop bits; intervals between characters may vary.

background
A background program is one that is not currently the focus of user input via a keyboard or mouse, but which remains operating while the user works on another program. In a DOS environment, the background program is not visible on the screen.

background processing
Work performed by a program while in background.

bandwidth
The range of transmission frequencies used by a network. The wider the bandwidth, the more information that can be transmitted concurrently.

baseband
A characteristic of networks in which a single (usually digital) signal is transmitted without changes in modulation. The full bandwidth of the channel is used and the simultaneous transmission of multiple sets of data is accomplished by time division multiplexing (e.g., Ethernet, 802.3 transmissions). Every transmission is received by all attached stations.

baud rate

The rate at which data is transmitted. At low speeds, equivalent to bits per second. At higher speeds, the bits per second measurement is higher than the baud rate, since one baud can be made to represent more than one bit.

binary file transfer

A file transfer mode that transmits a file containing binary characters without loss of data.

block mode

A mode of terminal operation in which data is edited within the terminal before it is transferred as a block to the host computer.

BPS

(Bits Per Second) The rate at which data is sent over a communications link.

bridge

A device connecting two or more networks of the same physical type (e.g., two Ethernet networks) that stores and forwards complete packets.

broadband

A characteristic of networks that use high frequency transmission over coaxial cable or optical fibers. The simultaneous transmission of multiple sets of data is accomplished by frequency division multiplexing. Broadband networks can transmit video, voice, and data at the same time, or a broadband network of one 100 MBps cable could function as ten independent virtual 10 MBps Ethernets. (Used almost exclusively for 802.4 transmissions).

broadcast
A packet delivery system that delivers a copy of a given packet to all hosts that attach to it. Can be implemented in hardware (Ethernet) or software.

BSD
(Berkeley Software Distribution) A version of UNIX developed at the University of California at Berkeley.

bus topology
The network design in which all devices on the network are connected by a main cable, or bus, rather than in a loop or a star.

carrier signal
A signal that is set by a modem on pin 8 of an RS-232 cable to indicate that a connection has been established with another modem, thus permitting data communication.

CCITT
(Consultative Committee for International Telephony and Telegraphy) An international organization, similar to IEEE, that develops communications standards.

character mode
A mode of terminal operation in which each character is transmitted to a host computer as it is keyed through the keyboard.

CI
(Command Interpreter) A program that reads lines of text from standard input (entered at the keyboard or redirected from a file) and interprets them as

requests to perform functions or execute other programs.

circuit switching
A network transmission process that, on demand, connects two or more computers or terminals and permits them the exclusive use of a data circuit until the connection is released.

clear to send (CTS)
A signal transferred from terminal to modem stating that the modem is ready to accept data for transmission.

client/server model
A cooperative processing model in which an application sends a request to an application at another location (near or far) and asks for a response. The requesting program is the client, and the application satisfying the request is a server.

command language
A language that is specific to a particular application and that is generally used to provide a simplified way of executing a series of common commands, such as logon sequences, dialing modems, initiating file transfers, and other tasks.

control character
A non-text character that signals the computer to perform an action or acknowledge a condition (e.g., a carriage return or line feed).

cooperative processing
The sharing of the computing workload among two or more computers. It can include peer-to-peer

communications, the client/server model, or other shared operations.

CSMA/CD
(Carrier Sense, Multiple Access with Collision Detection) A method of network transmission in which each computer checks the network medium to determine if the medium is in use before transmitting.

Ctrl
The Control key, also expressed as ^. Holding down the Control key changes the meaning of other keys struck in conjunction with it.

cursor
A symbol on the screen, in the form of a blinking line or rectangle, that indicates where the next typed character will be displayed.

DARPA
(Defense Advanced Research Project Agency) See *ARPANET*.

datacomm
Short for data communications, the act of transmitting data from its source to peripheral equipment or to another computer.

datagram
In packet-switching, a single packet with sufficient information for independent routing from the sending to the receiving station.

data set ready (DSR)
A signal that is set by a modem on pin 6 of an RS-232 cable to indicate that the modem is ready to

receive and transmit data. Most modems automatically set this signal *on* as soon as power is applied to the modem.

data terminal ready (DTR)

A signal set on by a terminal on pin 20 of an RS-232 cable to indicate that the terminal is ready for data communication. Some modems terminate a telephone connection after this signal has been absent for a certain period of time.

DCE

(Data Communications Equipment) Installed equipment that provides all the functions required to establish, maintain, and terminate a connection, and perform the signal conversion and coding between the terminal equipment and the common carrier's line (e.g., a data set or modem).

DDE

(Dynamic Data Exchange) A protocol for data exchange between Microsoft Windows programs, allowing them to request and exchange data automatically.

device

Any electronic or electro-mechanical machine or component; always refers to hardware.

device driver

A program that provides an interface between the operating system and a hardware device. Device drivers can be either DOS device drivers or TSRs.

disconnect
To terminate a network session. Disconnecting doesn't necessarily log you off a host computer.

display memory
That portion of a terminal's memory that stores received data. It is the contents of display memory that is shown on the screen.

DIX
The original Ethernet specification as defined in 1981 by a group of companies including Digital, Intel Corp., and Xerox. The specification described packet formats, cable requirements, and other Ethernet components.

DLL
(Dynamic Link Library) A set of program routines that are available to applications at run time. DLL is also the acronym for data link layer.

DNS
(Domain Name System) An online distributed database system used to map human-readable machine names (i.e., susan.msft.drv) to IP addresses.

domain
In IP terminology, a "family" name for a group of machines. Also part of the fully qualified network interface (NI) range for NS3000 on an HP3000.

domain name server
A node that resolves Internet addresses for network hosts.

DOS
Disk Operating System. Operating system developed by Microsoft for personal computers.

DOS device driver
A program that can be loaded into memory with a DEVICE=command in the CONFIG.SYS file. DOS device drivers cannot be removed from memory except by rebooting the computer without the "DEVICE=line" in the CONFIG.SYS.

download
The process of transferring data from another system to your own.

DTE
(Data Terminating Equipment) Equipment at which communications begin or end (e.g., a computer or terminal).

echo
A computer is said to echo if it immediately transmits back to the source each character that it receives. It serves as a confirmation of receipt.

ENQ
(Enquiry) A special character used to request a response. It may be part of the initialization sequence or the final character of a polling sequence.

environment
A term that refers to a particular computer configuration, which determines the programs that will run under it, including the CPU model and system software. Also used to refer only to the operating system.

escape sequence
A character string beginning with the ASCII escape character. Such strings constitute a command to perform some action. Escape sequences are sent to the terminal from the host, or entered through the keyboard.

Ethernet
The name given to a local area network packet-switched technology invented at Xerox. Also refers to three different kinds of cable, including 1/2-inch diameter coaxial cable; a lighter coaxial cable; a lighter coaxial cable (thinnet or cheapernet); or twisted pair cable.

Ethernet address
There are four types of Ethernet addresses: (1) A 48-bit (6 byte) number used for addressing on an Ethernet network; (2) a software specified Ethernet address; (3) broadcast address; and (4) multicast address. Each Ethernet card has a unique physical address.

Ethernet card
A hardware device that provides access to an Ethernet network. An Ethernet card must be supported by a device driver.

EUnet
The European UNIX network.

field
A part of a record designed to hold one category of data. For example, a mailing list would contain fields for name, address, and zip code.

file

A body of data stored at one location on a hard disk or floppy diskette under a unique filename. A file can contain random data, such as text, or can be organized as records, which in turn would contain one or more fields.

fixed-length record format

A file format in which all records have the same length.

flow control

The pacing of data in a transmission to ensure that the receiving station can absorb the data that has already been sent before sending more.

frame

An elementary block of data for transmission by certain protocols. The term derives from character-oriented protocols that add special start-of-frame and end-of-frame characters when transmitting packets.

FTP

(File Transfer Protocol) The Internet standard high-level protocol for transferring files from one machine to another over TCP/IP networks. FTP uses TCP to deliver its data. FTP is part of the Internet Protocol Suite.

full duplex

The data communications mode that allows data to be transmitted in two directions simultaneously.

gateway

A machine that connects two or more networks

using different network protocols, performing the necessary protocol conversions.

half duplex
A communications link that can transmit only in one direction at a time.

handshake
An exchange of characters between a terminal and a host computer that postpones transmission until a receiver is prepared to receive data.

host
In networking, any device with a network address; in terminal emulation, a minicomputer or mainframe accessed by a terminal or personal computer.

hostid
The second portion of a network address (or third, if there are subnet bits), consisting of host identification bits, which identify a particular host on a network (as opposed to the netid, which identifies the TCP/IP network itself).

host name
A non-numeric designation for a particular machine. The fully specified host name includes the domain, as well.

HOSTS file
An ASCII file containing the Internet addresses of available devices and the names that can be used to connect to these hosts.

ICMP
(Internet Control Message Protocol) A component of the Internet Protocol Suite that can report errors,

give limited routing advice, and provide simple low-level services over TCP/IP networks.

IEEE

(Institute of Electrical and Electronic Engineers) A standards-setting body that is responsible for 802-series standards. (802.3 refers to CSMA/CD [Ethernet]; 802.4 refers to a token-passing bus; 802.5 refers to a token-passing ring [e.g., IBM's Token-Ring].)

internet

A collection of networks.

Internet

A "network of networks" using the TCP/IP protocol suite and functioning as a single network. The Internet extends to many universities, research labs, government facilities, businesses, and private homes.

Internet address

The 32-bit address assigned to hosts participating in Internet using TCP/IP. Each address consists of a pair (netid, hostid). There are three primary classes of Internet addresses (A,B,C), grouped in descending order of size, with A representing networks with the greatest number of hosts and C representing networks with the fewest.

Internet Protocol Suite

See *TCP/IP*.

IP

(Internet Protocol) A public standard network layer protocol, widely implemented on many types of machines. See *TCP; TCP/IP*.

IP address
See *Internet address.*

IP datagram
The basic informational unit for Internet transmissions. Includes source and destination addresses and fields that specify length, header, data, checksum, and other information.

IPX
(Internetwork Packet Exchange) A network layer protocol used by Novell Netware. (No relation to IP).

ISO
(International Standards Organization) The international organization that develops standards for computers and other fields. It established the OSI model (sometimes referred to as ISO/OSI, or simply ISO model.).

KERMIT
A public domain file transfer protocol developed at Columbia University and named for Jim Henson's gregarious amphibian.

LAN
(Local Area Network) Any physical network that operates at high speed (usually tens of megabits per second through several gigabits per second) over short distances (up to a few thousand meters).

LANIC
(Local Area Network Interface Controller) A hardware card that fits into an HP3000 and provides a

physical interface for IEEE 802.3 local area networks.

LAN Manager
A local area network operating system from Microsoft that runs as an application under OS/2 in a file server and supports DOS and OS/2 and UNIX workstations.

line driver
A device that extends the distance over which digital transmissions can be made from terminals and computers that are linked via private lines.

linefeed
An ASCII control character that moves the cursor or the form (paper) to the next line.

local mode
A loopback mode of terminal operation in which data is not transmitted to a host computer, but is displayed on the screen.

local node
The networked computer you are currently using.

Martian
Term referring to packets that appear on the wrong network because of incorrect or false routing entries, or (on Internet) a packet with an unregistered address.

modem
A modem converts digital signals from a computer to analog (sound) signals for transmission over a phone line, and converts analog signals received through a phone line to digital signals.

MPE
Operating system of the HP3000 minicomputer. MPE stands for *Multi Programming Executive.*

multicast
A technique that allows copies of a single packet to be passed to a selected subset of possible destinations, i.e., to those devices that are "listening" for it.

multicast address
An address used to designate all nodes that "listen for" a particular message.

multiplex
To simultaneously transmit two or more messages through a single channel.

multitasking
Running two or more computer programs at once.

NAK
(No Acknowledgment) A character sent to indicate negative acknowledgment of the preceding data or command. See *ENQ; ACK.*

name
In the NS/VT environment, one of three address components, along with domain and organization, that define a node.

NDIS
(Network Driver Interface Specification) A specification that defines the interface between the transport protocols and the network card. NDIS was developed by Microsoft and 3Com.

NetBIOS
(Network Basic Input Output System) A standard

network interface specification for PC local area networks introduced with IBM's PC Network and used by Microsoft's LAN Manager.

netid

The first portion of a TCP/IP network address, consisting of network identification bits that are shared by the network the machine is on (as opposed to the hostid which identifies the host).

NetWare

Novell's line of network operating systems. NetWare uses Novell's proprietary IPX protocol to route messages.

network address

A special address that refers to a network as an entity, consisting of a netid and hostid, with the hostid consisting of all zero bits.

NFS

A distributed file system, developed by Sun Microsystems, Inc., and now a public standard, that works with TCP/IP and enables a group of computers to transparently access files on other machines as if they were part of the local file system.

node

A point of connection into a network. In multipoint networks, it's a unit that is polled; in LANs it's a device on a ring; in packet-switched networks, it's one of many packet switches that form the network's backbone.

NS/VT

(Network Services/Virtual Terminal) A protocol

from Hewlett-Packard used on HP3000 machines for an IEEE 802.3 LAN or inter-network.

null modem

A cable arrangement in asynchronous serial communications directly connecting two pieces of terminal equipment with RS-232 cable so that the sending wire on one end becomes the receiving wire on the other end.

ODI

(Open Datalink Interface) Novell's specification for a protocol-to-driver interface. ODI is a set of specifications that lets multiple communication protocols such as IPX/SPX and TCP/IP share the same driver and network interface card adapter.

operating system

A master control program for a computer that manages basic operations, including apportioning memory, ordering tasks, and managing the flow of information into and out of the main processor. The central core remains in memory at all times. The operating system sets the standards for applications programs that run on it.

OSI model

(Open Systems Interconnection model) A seven-layer model for describing network protocols developed by the ISO.

packet

The unit of data transmitted on a network. In addition to the data being transmitted, a packet contains information that allows networked computers to determine whether to receive it.

packet header
The portion of the packet that contains the control information - destination, origin, length, etc.

packet switching
The process of routing and transferring data by means of addressed packets. Data packets headed for different destinations can travel at random along the network and are assembled in sequence at the receiving end.

parallel port
A communication port through which data moves more than one bit at a time.

parallel transmission
The movement of data more than one bit at a time. This is accomplished by a cable that has a separate line for each bit position. For example, the IBM PC's parallel printer interface sends eight bits (one byte) in parallel.

parity
An error detection method that adds a non-information bit to each character transmitted. The bit may be always 0 (space parity), always 1 (mark parity), or either 0 or 1 so as to make the sum of the bits odd (odd parity) or even (even parity).

peer
A functional unit that uses the same protocol layer as another.

peer-to-peer communications
Communication from one user to another user on a network.

peer-to-peer network
A local area network in which all machines have equal access to the others' resources for cooperative processing.

physical layer
The level of the OSI model that is concerned with the physical connections between communicating devices.

PING
A program that tests a TCP/IP network node by sending an echo request and waiting for a reply. (Also used as a verb.)

port
A jack or outlet on a computer where connectors to peripheral devices or networks are attached; a virtual point-of-connection into TCP or UDP.

presentation layer
The OSI layer concerned with the encoding of application information for transmission between systems. The presentation layer receives data from the session layer and passes it to the application layer.

Probe protocol
A Hewlett-Packard protocol used by nodes on NS3000 IEEE 802.3 networks to obtain information about other nodes on the network. Probe translates between HP Network Services node names and both Internet and Ethernet addresses.

protocol
A formal set of rules governing the operation of a communications link.

protocol stack
Protocols that specify the rules for computer-to-computer communications.

proxy ARP
A TCP/IP technique in which one machine; usually a gateway, answers address resolution protocol requests intended for another machine by supplying its own physical address. Used as a way to avoid forming a subnet.

remote mode
A mode of terminal operation in which data is transmitted to and received from a host computer.

request to send (RTS)
A signal from a terminal to a modem indicating that the terminal is wanting to send data.

RFS
(Remote File System) A distributed file system developed by AT&T for the UNIX System V operating system.

ring topology
The layout of a LAN in which devices on the network are joined in a closed loop. (Does not preclude gateways to other networks.)

router
A network computer that makes decisions about which path, out of several, that network traffic is to follow; the computer then moves packets along the selected path.

RS-232
A standard cable type used to connect data

communications equipment. A 9-pin or 25-pin connector is typically used. (Also known as RS-232-C.)

SDLC
(Synchronous Data Link Control) The standard protocol for IBM's SNA networking model.

serial port
A communications port through which data moves over a single wire, one bit after another.

serial transmission
A method of data transfer in which one bit is sent at a time.

server
In the client/server model, a server is the application that provides the service requested by another application. On a PC LAN, a server is usually a dedicated PC that offers services such as disk space, printers, host computer access, and applications.

session layer
The OSI layer concerned with providing a way for session users to establish connections (sessions) and transfer data over them in an orderly way.

SMTP
(Simple Mail Transfer Protocol) The electronic mail protocol used in TCP/IP networks.

SNA
(Systems Network Architecture) IBM's proprietary network architecture.

SNMP
(Simple Network Management Protocol) The

preferred network management protocol for TCP/IP Internets.

star topology
A LAN architecture in which the network devices connect to a centralized controller or hub.

start bits
Bits transmitted before each data character to signal the beginning of the character.

status request
A request issued by a host computer for information from a terminal. An aid to communication between terminal and host.

stop bits
Bits transmitted after each data character to signal the end of the character.

subnet
To divide a network into subnetworks that are considered part of the same domain. The subnetworks continue to be viewed as one network by outside networks. Subnetting allows a site to use a single network ID to refer to multiple physical networks. Also used as a noun to refer to a subnetwork.

subnet address
An extension of the Internet addressing scheme that allows a site to use a single Internet address for more than one physical network.

subnetid (or subnet address)
The assignment of bits in a portion of the hostid to designate a particular physical network as a site with a single network identification and multiple physical

networks. Only the local gateways recognize the subnet address.

synchronous transmission
Data transmission in which both sending and receiving stations are synchronized, and data is sent in continuous streams.

TCP
(Transmission Control Protocol) The Internet standard transport-level protocol, providing reliable full duplex stream service. TCP allows a process on one machine to send a stream of data to a process on another. Software implementing TCP uses the IP protocol to transmit information. TCP establishes a virtual circuit and provides reliable end-to-end data transmission.

TCP/IP
(Transmission Control Protocol/Internet Protocol) Specifically, this term denotes the combination of TCP and IP; more generally, it refers to the Internet Protocol Suite, which includes TCP and IP, as well as several other protocols. TCP/IP has been implemented on several operating systems.

Telnet
An Internet protocol, used in conjunction with TCP/IP, that allows a computer to act as a terminal on a network.

terminal
A device that can be used to input, to receive, and to display data from a host computer.

terminal emulator
A software program that allows a personal computer

to behave as though it is a terminal. A desktop computer running a terminal emulation program may be used in place of a terminal.

terminal server
A device that allows the input/output of multiple terminals to be multiplexed onto LAN cable.

text file
A file consisting only of readable data; it contains no formatting information.

timeout
The process in which an intended operation is assumed to have failed because it was not completed within the time allotted.

token passing
A method of network transmission in which network devices pass along a certain sequence of bits ("token") from device to device. Only the device that has the token can transmit information along the network at a given point in time.

Token-Ring
An IBM-designed local area network that has ring topology and uses token passing.

topology
The general physical layout of a network (although it does not specify cable type, number of nodes, etc.). Examples include star topology, ring topology, and bus topology.

transport layer
The OSI layer concerned with controlling a

communication transaction between nodes (user-to-user communication).

TSR

(Terminate-and-Stay-Resident) A program that installs itself in memory and then returns control to the program that invoked it (usually COMMAND.COM).

twisted pair cable

Telephone wire; sometimes referred to as RJ 11, although an RJ 11 is actually a connector. Ethernet can be run on twisted pair cable.

typeahead

A feature that allows a user to enter data at the keyboard before being prompted by the host computer.

UART

(Universal Asynchronous Receiver/Transmitter) A device that receives and transmits data asynchronously and checks incoming data for errors.

UDP

(User Datagram Protocol) A low-overhead datagram protocol for the transport layer in TCP/IP networks.

uninstallable

A TSR program that you can remove from memory without rebooting the computer is known as an uninstallable program.

UNIX

Operating system designed by AT&T Bell Laboratories.

upload
The process of moving data from your computer to another system.

UUCP
(UNIX-to-UNIX Copy Program) A communications protocol for exchanging information between UNIX systems and others.

vector
Short for interrupt vector. PC's provide over 250 different interrupt vectors that may be used to pass control to software routines. Some vectors are associated with hardware interrupts (IRQs).

virtual circuit
A communications link that acts as though it is a dedicated point-to-point circuit. Also, a system that delivers packets so that they appear in sequence as though they were sent over a real point-to-point circuit.

virtual disk
A disk simulated in random access memory (RAM).

virtual network
A network that is programmed, not hard-wired, to a customer's specifications. Also called a Software Defined Network by AT&T.

WAN
(Wide Area Network) A network in which nodes (or smaller networks) are connected by long-distance communications methods, such as telephone lines and satellites.

wildcard

In MS-DOS, the symbol ? is used in place of single characters in filenames or extensions, and * is used in place of whole or partial filenames or extensions, indicating *all* for the given field.

XMODEM

Public domain file transfer software.

X Window System

A windows environment for graphics workstations developed at MIT in conjunction with Digital and IBM, popularly known as X Windows. Graphics generated on one computer system can be displayed on another workstation in the network with the X Window System. The X Window system can run under any operating system.

INDEX

132 Column Display
configuring, 23

3Com LAN Card
NET.CFG, example, 71
packet driver for, 77, 78
PROTOCOL.INI, example, 75

A

Acknowledgment Protocol
configuring, 9
for HP9000, 11

Advance Line
from device control keys, 39

Advance Page
from device control keys, 38

Advancenet
configuring, 94
NS connection, 63

ARPA Services
for Telnet connections, 63

ASCII
files, transferring, 51

ATI
configuring, 20

Auto Line Feed
from modes keys, 41

AUTOEXEC.BAT
for NDIS, 73
for ODI, 68
for ODI packet driver, 81

B

Baud Rate
configuring, 27

Bell
configuring, 25

Binary
files, transferring, 51

Block Mode
from modes keys, 41

C

Capture Packets
from debug mode, 45

Capture to Disk
from system keys, 37

Characters
expand control characters, 8

Clarkson Packet Driver
driver, 62
installing, 76
installing PACK92, 75
with ODI, 80

Clear All Margins
from margins/tabs/cols keys, 40

Clear All Tabs
from margins/tabs/cols keys, 40

Clear Tab
from margins/tabs/cols keys, 40

Color Configuration
screen, 26

Com Port
configuring, 28

Command Language
automatic script files, A2
error messages, C6
host executed script files, A2
manually executed script files, A3
MS92LITE, B1
script commands, A4
script files, A1
Commands
communicating with user, A5
file transfer, A7
function keys, 36
miscellaneous, A8
program flow, A6
script files, A4
sending and receiving, A4
CONFIG.SYS
for NDIS, 72
for ODI, 68
for ODI packet driver, 80
Config Keys
from system keys, 43
Configuration
baud rate, 27
color, 26
com port 28
config file, 13
config keys, 16, 43
datacomm, 27
file transfer, HP3000, 6, 9
file transfer, HP9000, 11
files, 14
function key labels, 25, 35
general, 13
hardware, 19
host, 34
keyboard options, 24
NACS, 90
network, 32
screen messages, labels, 15
screen size, 21
serial, 32
terminal, 29, 32
Copy All
from device control keys, 39
Copy Line
from device control keys, 39
Copy Page
from device control keys, 39

D

Datacomm Configuration
baud rate, 27
com port, 27
error messages, C7
handshaking, 27
parity, 27
screen, 27
Debug Mode
from debug keys, 44
from system keys, 44
function keys, 44
messages, LAN, C2
running, C2
Destructive Backspace
configuring, 24
Device Control
from device modes keys, 38
Device Modes
from device control keys, 38
Display Functions
from modes keys, 41

DOS
shell, 53
Drivers
Clarkson Packet, installing, 76
Clarkson Packet Driver, 62
NDIS, 61
ODI, 61

E

EGA
configuring, 19
Enter Key
configuring, 24
Error Messages
command language, C6
datacomm configuration, C7
debug messages, LAN, C2
file transfer, C8
special configuration, C7
upload host program, C8-C9
ETVGA-4000
configuring, 20
Event Trace
from debug mode, 44
Examples
automatic file transfer, MS92LITE, B12
host initiated file transfer, A16
MS92LITE command lines, B6
NET.CFG, 69-71
PROTOCOL.INI files, 74-75
REDIRECT, MS92LITE, B21-B22
script files, A12
WAIT, MS92LITE, B24
Exiting
cancel from file transfer, 52
disconnecting from LAN, 43, 59
ending MS92 session, 59
quit key, 43
shell to DOS, 53
Expand Control Characters
and host program, 9

F

File Transfer
ASCII files, 51
automating, MS92LITE, B9
binary files, 51
configuring, HP3000, 6-10
configuring, HP9000, 11-12
error messages, C8
from system keys, 44
host initiated, A15-A16
host initiated, MS92LITE, B14-B18
host file size, 49
how to, 48-52
installing, HP3000, 6-10
installing, HP9000, 11-12
listing local files, 50
protocol, 8
record size, 51
save file info, 51
script commands, A7
WAIT, MS92LITE, B23
X.25 networks, 9
Xmodem, 8
File Transfer Configuration
HP3000, 6-10
HP9000, 11-12
Foreign Language
currency delimiter, 25

editing MS92.MSG, 15
Function Keys
configuring, 16
debug keys, 44
defined, 35
device control keys, 38-39
labels, configuring, 15, 25, 35-36
margins/tabs/cols keys, 39-40
menu key, 45
menus, 36
modes keys, 40
special keys, 43-44
system keys, 37-43
user-defined keys, 45-48

H

Handshaking
configuring, 30
MPE/iX, 28
Help
from system keys, 44
key combinations, 54
Host Computer
file, transferring, 49
host initiated file transfer, A15-A16
network requirements, 63-64
script language, A2
Host Configuration
screen, 34
HP Advancenet
see Advancenet
HP EtherTwist LAN Card
packet driver for, 78
HP-SVGA
configuring, 20
HP VGA
configuring, 20
HPISA16 LAN Card:
NET.CFG, example, 69

I

IBM XGA Video Card
configuring, 20
Installation
Clarkson Packet Driver, 75, 76
file transfer, HP3000, 6-10
file transfer, HP9000, 11-12
from diskettes, 3-4
MS92, network, 65-66
MS92LITE, 3-4
NDIS driver, 71-75
network device drivers, 66-67
ODI driver, 67-71
Intel Etherexpress LAN Card:
NET.CFG, example, 69
IPXODI
driver, installing, 68

K

Kodiak Noteport LAN Card
NET.CFG, example, 70

L

LAN Workplace for DOS
configuring, 90-92
Left Margin
from margins/tabs/cols keys, 40
Line Modify
from modes keys, 40
Local
files, transferring, 49
Log Bottom
from device modes keys, 38
Log Top
from device modes keys, 38
Lotus 1-2-3
redirecting printing, MS92LITE, B23

M

Margins/Tabs/Cols
from system keys, 39
Memory Lock
from modes keys, 41
Menu Key
ALT-M, 45
Microsoft Word
redirect print, MS92LITE, B23
Modem
automating procedures, 56
dialing, 55
Modes
see also Device Drivers
from special keys, 43
from system keys, 40
Modes Keys
displayed, 40
Modify All
from modes keys, 40
Monitor
color, configuring, 26
MPE/iX
handshaking, 28
MS92LINK
conditions for using, 6
expand control characters, 9
uploading, 6-7, 11, 12
MS92LITE
command language, B1-B24
installing, 3
MS92LNK2
conditions for using, 6
expand control characters, 8
MS92LNK3
conditions for using, 6
expand control characters, 9
native mode, 7
MS92LNK4
conditions for using, 6
expand control characters, 9
native mode, 7
MXIC Video Card
configuring, 20

N

NACS
configuring, 93-94
Native Mode
link program, 7

NDIS
AUTOEXEC.BAT, 73
CONFIG.SYS, 72-73
defined, 71
driver, 61
driver, installing, 72
installing NDIS92, 71-75
PROTOCOL.INI, 73-75
NET.CFG
configuring for ODI drivers, 69-71
example files, 69-71
frame types listed, 71, 81
Netmod
defined, 96
Netshow
defined, 96
Network
card, 61
Clarkson Packet Drivers, 76-82
debug messages, C2
debug mode, C2
device drivers, 66-67
disconnect key, 43
driver, 61-62
host requirements, 63-64
installing MS92, 65-66
losing a connection, 59
MS92 package, 60
protocol stack, 62-63
switching hosts, 59
utilities, 96
Network Configuration
Advancenet, 94-95
how to, 83-84
LAN Workplace for DOS, 90-92
NACS, 93-94
NS, 87-90
Telnet, 84-87
NETX
driver, installing, 68
Novell
NACS, 93
ODI92 driver, installing, 67-71
Novell LAN Card
NET.CFG, example, 70
packet driver for, 79
PROTOCOL.INI, example, 74
NS
configuring, 87-90
network connection via NDIS, 71
protocol stack, 63

O

Oak Video Card
configuring, 20
ODI
defined, 67
driver, 61
installing ODI92, 67-69
Operation
debug mode, C2
modes, 40-41
MS92, network, 59-60
running MS92 from DOS, 5
running MS92LITE, 5
Orchid Video Card
configuring, 20

P

Paradise Video Card
configuring, 19

Print to Host
from system keys, 42
Printing
device control, 37
print to host, 42
redirecting to host, 10, B19-B22
PROTOCOL.INI
configuring for NDIS driver, 73-74
example files, 74-75
Protocol Stack
defined, 62
NS, 63
TCP/IP, 62-63
Telnet, 63

R

Record Mode
from device modes keys, 38
Record Size
and file transfer, 51
Redirect
to host printer, 10, B19-B22
Refresh Screen
from debug keys, 44
Remote Mode
from modes keys, 41
Return
configuring, 24
Right Margin
from margins/tabs/cols keys, 40

S

Saving
configuration changes, 14
file info on transfer, 51
Screen
capture to disk, 42
configuring memory, 23-24
configuring size, 21-22
labels, 15
margins/tabs/cols, 39-40
terminal options, 30
Script Files
automatic execution, A2
commands, A4-A8
examples, A2-A15, A16-A20
host executed, A2, A15-A16
manual execution, A3
run-time parameters, A3
Scroll
left/right, configuring, 22
scroll lock, 54
Serial
connection, configuring, 32-33
port, 28
Set Tab
from margins/tabs/cols keys, 39
SMC Elite 16 LAN Card
NET.CFG, example, 70-71
PROTOCOL.INI, example, 74-75
Smooth Scroll
from modes keys, 41
Special Configuration
bell, 25
destructive backspace, 24
error messages, C7
initial keys, 45
return key, 24
screen memory, 23-24
typeahead, 25
video card, 19

Special Keys
ALT-X, 43
disconnect, 43
file transfer, 44
from debug keys, 44
help, 44
modes, 43
quit, 43
Speedstar Video Card
configuring, 20
Starlan LAN Card
packet driver for, 78
Start Column
from margins/tabs/cols keys, 39
System Keys
ALT-S, 37
capture to disk, 42
config keys, 16-18, 43
debug, 44
margins/tabs/cols, 39-40
modes, 40-41
print to host, 42

T

Tabs
configuring as spaces, 10
TCP/IP
and packet drivers, 80
incorporated in MS92, 62-63
NS for Netware, 94
Telnet
configuring, 84-85
network connection via NDIS, 71
protocol stack, 63
Terminal
configuring, 29-32
Terminal ID, 29
VT emulation, 31
Thinlan/XL
for NS connections, 94
Thinlan LAN Card
packet driver for, 78
To Display
from device control keys, 38
To External Device
from device control keys, 38
Troubleshooting
debug mode, 44, C2
losing a connection, C1
TVGA
configuring, 20
Typeahead
configuring, 25

U

Upload Host Program
error messages, C8-C9
Upload host program
see Installation, file transfer, 52
User-Defined Keys
ALT-F, 45
ALT-U, 45
defining, 45
loading, 45
local only, 47
normal keyboard input, 46
transmit only, 46

V

VGA
configuring, 19
Video Card
see also specific name
132-column display, 23
configuring, 19
Video Seven
configuring, 20
VT Emulation
configuring, 31

W

Wait Command
MS92LITE, B23-B24
Western Digital LAN Card
packet driver for, 79
WordPerfect
redirect print, MS92LITE, B23

X

X.25 networks
host read trigger, 9
Xmodem
configuring, 8
for transferring files, 8
for transferring host program, 11

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